

## Water Framework Directive (WFD) Compliance Assessment



## Contents

<b>1</b>	<b>INTRODUCTION</b> .....	<b>1</b>
1.1	Background .....	1
1.2	WFD study area .....	2
1.3	Information sources.....	4
<b>2</b>	<b>LEGISLATION AND GUIDANCE</b> .....	<b>5</b>
2.1	Water Framework Directive.....	5
2.2	Compliance with the WFD.....	5
2.3	Steps in the WFD assessment process .....	6
2.3.1	Stage 1 – screening .....	7
2.3.2	Stage 2 – scoping .....	7
2.3.3	Stage 3 – impact assessment.....	7
2.3.4	Stage 4 - justification or WFD exception .....	8
2.4	Water body classification .....	8
2.5	Water body objectives .....	9
<b>3</b>	<b>BASELINE ENVIRONMENT</b> .....	<b>10</b>
3.1	Catchment physical setting .....	11
3.1.1	Dodder_SC_010 subcatchment.....	11
3.1.2	Tolka_SC_020 subcatchment.....	12
3.2	WFD status classification .....	12
3.3	Heavily Modified Water Body Designation.....	16
3.3.1	Designation .....	16
3.3.2	Good Ecological Potential.....	18
3.3.3	Mitigation Measures.....	19
3.3.4	Biological quality elements (BQE) that are not sensitive to the hydromorphological modification.....	21
3.3.5	Physico-Chemical Conditions .....	21
3.3.6	Biological quality elements that are sensitive to the hydromorphological modification.....	21
3.4	Register of Protected Areas .....	21
3.4.1	Bathing Waters .....	22
3.4.2	Nutrient Sensitive Waters .....	24
3.4.3	Natura 2000 Protected Areas .....	25
<b>4</b>	<b>PROJECT DESCRIPTION</b> .....	<b>27</b>
<b>5</b>	<b>WFD ASSESSMENT</b> .....	<b>31</b>
5.1	Stage 1: Screening.....	31
5.2	Stage 2: Scoping.....	31
5.2.1	Project design parameters .....	31
5.2.2	Scoping summary .....	40
5.3	Stage 3: Impact Assessment .....	43
5.3.1	Measures included in the Project.....	43
5.3.2	Deterioration in water body status .....	54
5.3.3	Protected area objectives .....	61
5.3.4	Achievement of the WFD objectives.....	62
<b>6</b>	<b>SUMMARY</b> .....	<b>65</b>
<b>7</b>	<b>REFERENCES</b> .....	<b>66</b>

## List of Figures

Table 1-1: Information Sources .....	4
Table 2-1: Key Steps in the Water Status Impact Assessment Process.....	6
Table 3-1: WFD Status (2007-2021) .....	14
Table 3-2 WFD Status Breakdown (2016-2021) .....	15
Table 3-3: Mitigation Measure Categories.....	20
Table 3-4 Annual Assessment Criteria for Bathing Waters .....	22
Table 3-5 Summary Status of Samples during the 2023 Monitoring Season .....	24
Table 5-1: Project design parameters used for the assessment of potential impacts for WFD Assessment.....	33
Table 5-2: Potential impacts associated with the Project and outcome of scoping assessment for the WFD compliance assessment for onshore surface water bodies in the WFD study area.....	41
Table 5-3: Measures included in the Project.....	44
Table 5-4: Recommended piling periods denoted by green ticks and non-piling windows denoted by red crosses .....	51
Table 5-5: Summary of mitigation measures to ensure the surface water body status does not deteriorate .....	59
Table 5-6: Significant Water Management Issues (SWMI), Source, Programme of measures and assessment of impact of the project on the WFD objectives.....	63

## List of Figures

Figure 1-1: Site Location in the Context of the Wider Surface Water Environment .....	3
Figure 3-1: Elements of the Water Framework Directive Status.....	11
Figure 3-2 Water Framework Directive Water Body Status – Reported 2022 .....	13
Figure 3-3 Bathing Water Status in the Dublin Area 2023 (EPA, 2024).....	23
Figure 3-4 Nutrient Sensitive Areas.....	25
Figure 3-5: Natura 2000 Designated Sites .....	26
Figure 4-1: Proposed 3FM Project infrastructure works.....	28

# 1 INTRODUCTION

## 1.1 Background

The completion of a Water Framework Directive (WFD) Compliance Assessment (hereafter referred to as 'WFD Assessment') is a staged process. The proposed works on the 3FM Project (hereafter referred to as 'the Project') are assessed with respect to the requirements of the WFD. The assessment identifies if the Project, will, or will not, have a detrimental impact on the status of water bodies that are hydrologically linked to the Project. If the assessment concludes, after taking account of the measures included in the Project, that the Project may either result in;

- A deterioration of the status of the water bodies; or
- Prevent them from reaching their environmental objectives;

then, this represents a failure to achieve the WFD objectives and the Project should not proceed unless justification for the proposed works is demonstrated under Article 4.7 of the WFD in the context of new modifications.

Whilst Environmental Assessment is an efficient mechanism to gather the relevant information for WFD compliance assessment, it still needs to be interpreted in relation to the WFD objectives and the potential impacts on biology, chemistry and hydromorphology. The WFD objectives and the biology, chemistry and hydromorphology need to be considered in relation to WFD status classes and reported under a specific WFD section in any environmental impact assessment report (EIAR) or report produced or in a separate WFD compliance report (Environment Agency, 2010).

Therefore, a WFD Assessment has been undertaken to assess the potential impacts of the Project in the context of the environmental objectives of any affected WFD surface water and groundwater bodies.

The WFD Assessment also offers the opportunity to inform the management of the Project to avoid, minimise, mitigate, or compensate for the risks to the environmental objectives of WFD surface water receptors where the risk assessment determines that the activities have the potential to:

- i. Cause a surface water body to deteriorate from one WFD status class to another or cause significant localised impacts that could contribute to this happening; and
- ii. Prevent or undermine action to get surface water bodies to good status (e.g. compromise the programme of measures put in place to achieve the ultimate water body objective).

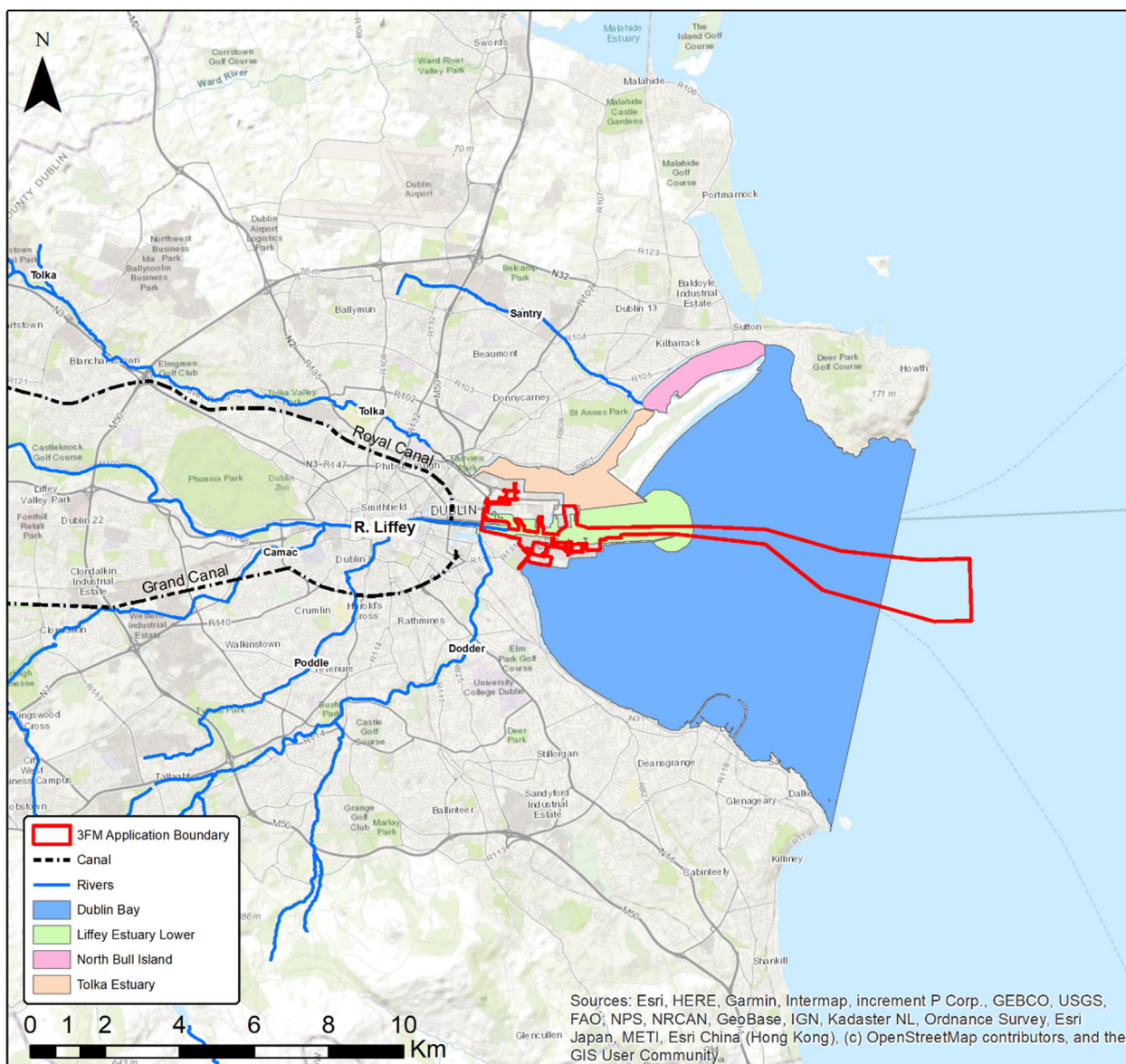
## 1.2 WFD study area

For the purposes of this WFD Assessment, water bodies that are within, intersect or which are hydrologically connected to the onshore and marine elements of the Project have been identified and considered as relevant water bodies for the different stages of the WFD compliance assessment (i.e., the WFD assessment study area, hereafter referred to as “WFD Study Area”).

For the purposes of monitoring and assessing the quality of surface waters, all rivers, lakes, coastal inter-basins, estuaries, and coastal waters (within one nautical mile of the shoreline) have been divided into management units called “water bodies”. The condition of each water body must be reported to the European Commission in the form of ecological status and chemical status. Groundwater bodies are similarly delineated with quantitative and qualitative status identified.

Surface water bodies are grouped into sub-catchments for the purposes of water management, of which there are 583 nationally. These are further grouped into catchment management units of which there are 46 based on the hydrometric areas used by public authorities. As illustrated in Figure 1-1, the 3FM Project, including its capital dredging elements, will take place within the Liffey Estuary and the existing licenced offshore dump site in Dublin Bay will be used for the disposal of Class 1 dredged material (Uncontaminated: no biological effects likely) arising from the capital dredging. The landward components of the Project on the Poolbeg Peninsula are located within the sub basin of the Dodder\_050 river water body on the south side of the Liffey Estuary whilst the footprint of the SPAR on the north side of the Liffey estuary is located within the sub basin of the Tolka\_060 river water body. However, in reality these project locations will drain naturally to the Liffey Estuary Lower or Dublin Bay given the locations adjacent to the coast and remote from the downstream extent of these river water bodies. The works are therefore located within four surface water bodies: ‘Liffey Estuary Lower’ transitional water body (EA\_090\_0300) and ‘Dublin Bay’ coastal water body (EA\_090\_0000), the Dodder\_050 river water body and the Tolka\_060 river water body. The ‘Liffey Estuary Upper’ (EA\_090\_0400) transitional waterbody is situated upstream of the works and the ‘Tolka Estuary’ (EA\_090\_0200) transitional water body is located downstream.

There are also several other rivers that discharge into the Liffey Estuary and Dublin Bay; principally the Liffey itself along with the Camac, located in the upstream Liffey subcatchment, and the Poddle which is located in the Dodder subcatchment. The Royal Canal, located within the Tollka\_SC\_020 subcatchment to the North of the Liffey, and the Grand Canal, located to the south of the Liffey, also discharge to the Liffey Estuary Lower. In addition, several small streams flow from the surrounding areas directly into Dublin Bay.



**Figure 1-1: Site Location in the Context of the Wider Surface Water Environment**

The 3FM Project lies within the ‘Dublin Urban’ groundwater body (EA-G-008). This water body has achieved and maintained ‘good’ status in each WFD Monitoring Cycle from 2007-2012 to 2016-2021. All these waterbodies are grouped into the ‘Liffey and Dublin Bay Catchment’ (HA09) of the Irish River Basin District.

Due to the nature of the 3FM Project and the relatively limited scale of geotechnical activities in the application area, there are no likely significant water quality effects on groundwater expected and these have therefore not been assessed further in this report. This is supported by the hydrogeological assessment presented in Chapter 8 of the Environmental Impact Assessment Report which addresses Soils, Geology and Hydrogeology.

## 1.3 Information sources

The information sources used in the preparation of this technical report are set out in Table 1-1.

**Table 1-1: Information Sources**

Source	Data	Information consulted/provided
EPA	WFD data tables <a href="https://wfd.edenireland.ie/data">https://wfd.edenireland.ie/data</a> (accessed April 2024)	<i>Water body status, objectives, hydro-morphology, protected areas, sensitive habitats</i>
	Water body data pages on Eden WFD application <a href="https://wfd.edenireland.ie/">https://wfd.edenireland.ie/</a> (accessed April 2024)	<i>Water body classification, overall status, ecological status, biological elements, physico-chemical elements, hydro-morphology, and chemical classification</i>
	Interactive maps <a href="https://gis.epa.ie/EDENMaps/WFD">https://gis.epa.ie/EDENMaps/WFD</a> (accessed April 2024)	<i>WFD objectives for water bodies</i> <i>WFD Cycle 3 Report – Liffey and Dublin Bay Catchment (HA 09)</i> <i>WFD Cycle 2 Report - Catchment Liffey and Dublin Bay Sub catchment Dodder_SC_010 Code 09_16</i> <i>WFD Cycle 2 Report - Catchment Liffey and Dublin Bay Sub catchment Tolka_SC_020 Code 09_4</i>
GeoHive	Environmental Sensitivity Mapping <a href="https://airomaps.geohive.ie/ESM/">https://airomaps.geohive.ie/ESM/</a>	<i>Marine Habitat sensitivity</i>

## 2 LEGISLATION AND GUIDANCE

### 2.1 Water Framework Directive

The WFD (Council Directive 2000/60/EC establishing a framework for community action in the field of water policy) was adopted by the European Commission in December 2000. The WFD requires that all European Union Member States prevent deterioration and protect, enhance, and restore all bodies of water. This means that Member States must ensure that new schemes do not adversely impact upon the status of aquatic ecosystems, and that they must address historical modifications that are already impacting a water body.

The WFD was transposed into Irish law through the European Communities (Water Policy) Regulations 2003 (S.I. 722/2003) (as amended) in respect of the duties on all public authorities to exercise their functions in a manner consistent with achieving the objectives of the WFD. European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 272/2009) (as amended) and the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. 9/2010) (as amended) give further effect to the WFD in Ireland. Article 5 of both these regulations provide that public authorities must not undertake their functions in a manner that knowingly causes or allows deterioration in the status of water body.

The WFD is given general effect in planning legislation in Section 1A of the Planning and Development Act 2000 (S.I. 30/2000), as amended; and specifically, through amendments made in 2010 which sought to improve how water management and the planning system are integrated.

### 2.2 Compliance with the WFD

Member states must meet the conditions of the WFD unless they meet the criteria laid out in Article 4.7 of the Directive. The Water Policy Regulations require the assessment of impacts of a project on WFD waterbodies as proposals for plans or new developments have the potential to prevent compliance with the WFD objectives i.e., will they cause a deterioration of the status of a water body and / or prevent future attainment of good surface water status/potential and good groundwater status where not already achieved.

Development proposals within, or that could affect the water environment must demonstrate that they will not cause a deterioration of the status of water bodies in their zone of influence, or that they will not inhibit their future achievement of “good” status. In some situations, it will be clear that a development proposal would not compromise the achievement of the WFD objectives and therefore no further assessment will be required. However, in other situations, the potential to compromise the achievement of the objectives may be identified or there may be uncertainty and the development proposal will need to undergo a WFD Assessment to inform decision making by the planning authority. Opportunities to include pro-active design measures to avoid and mitigate impacts will become the norm for developers in order to reduce the scope and extent of the WFD Assessment necessary in any application. These proactive measures will include for example, design of structures to reduce the impact on or create intertidal habitat, improvement in flow dynamics etc.



## 2.3 Steps in the WFD assessment process

Whilst guidance for undertaking a WFD Assessment is being prepared for Planning Authorities in Ireland, it is not yet published and therefore the UK Planning Inspectorate Guidance Note 18: The Water Framework Directive (Planning Inspectorate, 2017) has been followed. This requires that a WFD Assessment is undertaken in four stages:

- **Stage 1 Screening** – excludes any activities that do not need to go through the scoping or impact assessment stages
- **Stage 2 Scoping** – to identify potential risks associated with a development proposal on the relevant water bodies and their water quality elements.
- **Stage 3 Impact assessment** – to undertake a detailed assessment of water bodies, their quality elements and activities carried forward from the scoping stage.
- **Stage 4 Justification or Exemption** - rigorous assessment of the appropriateness, or otherwise, of particular developments that, for various reasons, are being considered despite failure to comply with the objectives of the WFD, as laid down in Article 4(7).

The key steps in the development stage process are briefly outlined in Table 2-1.

**Table 2-1: Key Steps in the Water Status Impact Assessment Process**

Step	Development Management
<b>Screening</b>	Screening is required to determine whether a development proposal would screen in / out for more detailed consideration of WFD objectives.
<b>Scoping &amp; Consultation</b>	Once a development proposal is screened in it will rely on the professional expertise of the applicant's specialist consultants and, if/as required, the Environment Section of the planning authority and other bodies to engage in more specific pre-application consultation in relation to the requirements and to agree the scope of the assessment. The scope of the WFD Assessment must be proportionate to the type/scale of development and the sensitivity of the water body(s).
<b>Assessment &amp; Reporting</b>	Applications for development proposals which have screened in for detailed consideration of WFD / River Basin Management Plan (RBMP) objectives, must clearly demonstrate that the proposal is compliant with the objectives of the WFD i.e., it will not cause or contribute to deterioration of status or jeopardise the water body achieving good status. Where the competent authority concludes that significant negative impacts on a water body cannot be fully avoided (i.e., with the potential to cause deterioration of its status or jeopardise its attaining good status), or uncertainty remains of the extent of impact, it is required to refuse consent, unless a derogation under article 4 (7) is sought and justified under the strict conditions of the WFD for new modifications. Where water quality is an issue (but not so as to cause the deterioration of the status of any body of water or jeopardise its attaining good status), the competent authority shall consider granting permission subject to conditions to deal with any residual risk and must be guided by the development management objectives set out in the development plan. Where potential for significant effects is identified, a mitigation and monitoring strategy shall be presented. This can align with EIAR requirements if screened in for EIA. Otherwise, a mitigation and monitoring strategy should be agreed with the planning authority and the developer to ensure no unforeseen effects from the construction or operation of the development.
<b>Justification or WFD Exception</b>	Where a development proposal is considered likely to cause deterioration of the status (or potential) of a surface or groundwater body or prevents the achievement of good groundwater status, good ecological status / potential for water bodies currently failing to achieve this status / potential, Article 4(7) of the WFD provides a derogation whereby a Member State will not be in breach of the Directive provided all the conditions set out in Article 4(7) are met.

### 2.3.1 Stage 1 – screening

Where a development requires mandatory EIA, or it is screened in for EIA, if it is not mandatory, water environment is a prescribed environmental factor to be addressed in the EIAR. The development would therefore automatically screen in for WFD assessment and a WFD Compliance report should be prepared by a suitably qualified professional and submitted with the application.

In some situations, it will be clear that a proposed development could not cause deterioration or compromise the achievement of good status / potential and it should screen out for WFD Assessment. For example, where the nature, scale, timing, duration and location of a development is entirely unconnected to a water body or will not contribute to a further deterioration of the water body's current status. These instances will generally be small developments, for example signage or changes of use or extensions to existing buildings in serviced urban areas.

Other development proposals may require further consideration for screening. In these situations, the source-pathway-receptor (S-P-R) model will be useful in terms of considering the potential risk of a proposed development causing further deterioration of the water body's current status, for example, if the proposed development includes a source (e.g. risk of pollution), is there a pathway (i.e. hydrological connectivity (including flood risk) via water body or groundwater) and is there a receptor (i.e. water body at risk).

### 2.3.2 Stage 2 – scoping

Scoping considers how a development proposal could affect the different WFD quality elements. Each aspect or activity associated with the development with the potential to impact the achievement of the WFD should be considered and then summarised in table form for each water body.

WFD Scoping should involve:

- Undertaking an initial assessment to identify the risks from the development proposal to receptors (within the zone of influence) based on the relevant water bodies and their water quality elements; and
- Identification of those water bodies where a more detailed impact assessment is required.

This will require that the types of impact be identified, e.g., on what quality element; whether the effects are short, medium or long-term and, construction, operational or decommissioning related.

### 2.3.3 Stage 3 – impact assessment

The Stage 3 assessment process is focused on assessing the potential for the proposed development to impact on the objectives of the WFD and the RBMP. This can be an iterative process and the objective should be to find an appropriate solution wherever possible – this may include assessment and amending the design and/or including measures to mitigate the particular elements of the development that posed the risk.

The particular elements of the proposed project that have the potential to adversely affect the quality of a water body must be examined with respect to the specific objectives of the WFD and the RBMP. The information collected should facilitate:

1. The identification and description of those aspects of the project that may affect a water body;
2. A description of the characteristics of relevant water body, including their WFD objectives and an understanding of factors which either maintain or threaten those objectives;
3. An assessment of the impact of the proposed development on the relevant objectives; and
4. To conclude whether the proposed development will:
  - a. Cause or contribute to deterioration of status; or
  - b. Jeopardise the water body achieving *good status* (or *high status in the case of a waterbody with a high-status objective*).

### 2.3.4 Stage 4 - justification or WFD exception

Where a development proposal is considered likely to cause deterioration of the status (or potential) of a surface or groundwater body or prevents the achievement of good groundwater status, good ecological status / potential for water bodies currently failing to achieve this status / potential, Article 4(7) of the WFD provides a derogation whereby a Member State will not be in breach of the Directive provided all the conditions set out in Article 4(7) are met. In the case of the 3FM Project the assessment stage has concluded that there is no risk of deterioration in the WFD status of any water bodies affected nor will the Project compromise the achievement of the environmental objectives of these water bodies under the WFD. Therefore, for this Project the assessment ends at Stage 3.

## 2.4 Water body classification

The WFD specifies the quality elements that are used to assess the chemical and ecological status of a water body. Quality elements are generally biological (e.g. fish, invertebrates, macrophytes) or chemical (e.g. heavy metals, pesticides, nutrients). Classifications indicate where the quality of the environment is good, where it may need improvement, and what may need to be improved. They can also be used, over the years, to plan improvements, show trends and to monitor the effectiveness of the programme of measures identified. There are two status classifications which are commonly reported, chemical and ecological.

Chemical status is assessed from compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances. These are known as 'Annex X' substances as they were originally listed in Annex X of the Water Framework Directive, which has now been superseded by the Environmental Quality Standards Directive (2008/105/EC). Chemical status is recorded as 'good' or 'fail'. Chemical status for a water body is determined by the worst scoring chemical (one-out-all-out approach).

Ecological status classifications can be composed of up to four different assessments:

- An assessment of status indicated by a biological quality element such as fish, invertebrates or algae. The presence of invasive species is also assessed as a separate test;
- An assessment of compliance with environmental standards for supporting physico-chemical conditions, such as dissolved oxygen, phosphorus or ammonia;

- An assessment of compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic (these are known as 'Annex VIII' substances); and
- In determining high status only: A series of tests to make sure that hydromorphology is largely undisturbed.

Ecological status is recorded as high, good, moderate, poor or bad. 'High' represents 'largely undisturbed conditions'. Other classes show increasing deviation from undisturbed or reference conditions. This deviation must be expressed as an ecological quality ratio (EQR) which ranges from zero for bad status to one for high status. As with chemical status, ecological status is determined by the worst scoring component (one-out-all-out approach). Biological status is a sub-set of ecological status where the results of the biological quality elements are assessed (and so ignore physico-chemical and Annex VIII substances and hydromorphology). The one-out-all-out rule is applied again here to give a biological status classification.

Overall status is a composite measure that looks at both ecological status and chemical status. It considers all four assessment types under ecological status (biology, physico-chemical, Annex VIII substances and hydromorphology) as well as incorporating the results of the chemical status assessment. The one-out-all-out rule is applied again here, so a water body must be good or better ecological status, and good (pass) chemical status assessment to be given a good overall status.

## 2.5 Water body objectives

The completion of a WFD assessment is a staged process where data on the study area and work proposals are assessed with respect to the requirements of the WFD to ascertain if the proposals will, or will not, have a detrimental impact on the status of water bodies associated with that site. If the assessment concludes, after taking account of the mitigation proposed, that the proposal may either reduce the status of the water bodies or prevent them from reaching the required status, then this represents a failure to achieve the WFD objectives and it should not go ahead unless justification for the new modification can be justified under Article 4.7 of the Directive.

The four objectives of the WFD Assessment are:

1. Objective 1: To prevent deterioration in the status of the water body;
2. Objective 2: To prevent the introduction of impediment to the attainment of Good WFD status for the water body;
3. Objective 3: To ensure the attainment of the WFD objectives for the water body are not compromised; and
4. Objective 4: To ensure the achievement of WFD objectives in other water bodies within the same catchment are not permanently excluded or compromised.

### 3 BASELINE ENVIRONMENT

The fundamental objectives of the WFD are to maintain “high status” of surface waters where it exists, prevent deterioration in the existing status of waters, and achieve at least “good status” in relation to all waters by the end of the current river basin management cycle unless a water body is subject to an extended deadline under Article 4(7) of the Directive. A water body must achieve both good ‘ecological status’ and good ‘chemical status’ before it can be considered to be at good overall status. An assessment of the risks to the achievement of these objectives for water bodies has been undertaken by the EPA through the extensive characterisation of water bodies and the key pressures acting upon them. This characterisation process allows the development of a programme of measures to aid the achievement of the WFD objectives.

A Programme of Measures (PoMs) outlines the steps that will be taken to meet WFD objectives applicable to each water body. This Programme is contained within an overarching River Basin Management Plan (RBMP). These measures will require implementation at strategic level but also at regional and local level through the establishment of Regional Integrated Catchment Management Programmes. Areas for Action are areas where focused action will be carried out in the river basin management cycle. The Areas for Action were selected based on the priorities in the draft river basin management plan, the evidence from the Water Framework Directive characterisation process, and the expertise, data and knowledge of public body staff with responsibilities for water and the different pressure types. The landward water bodies within the WFD Study area have been included in an Area for Action in the third River Basin Management Cycle with a restore environmental objective. The Tolka\_060 river water body are within the Tolka Lower Area for Action where the lead Authority is Dublin City Council, whilst the Dodder\_050 river water body is located in the Dodder Area for Action where the lead Authority is the Local Authority Waters Programme (LAWPRO).

Environmental Quality Standards (EQSs) for classifying surface water status are established in the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (SI No. 272 of 2009), as amended. These regulations set standards for biological quality elements, physico-chemical conditions supporting biological elements (including general conditions and specific pollutants), priority substances and priority hazardous substances.

As shown in Figure 3-1 the ‘ecological status’ of a water body is established according to compliance with the EQSs for biological quality elements, physico-chemical conditions supporting biological elements and relevant pollutants and hydromorphological quality elements. The ‘chemical status’ of a water body is established according to compliance with the EQSs for priority substances and priority hazardous substances. In addition to achieving good ecological and chemical status, a water body must achieve compliance with standards and objectives specified for protected areas, which include areas designated by the Bathing Water Directive; the Urban Waste Water Treatment Directive; the Shellfish Waters Directive; the Habitats Directive and the Birds Directive. Waters bodies that are compliant with WFD standards, but that contain protected areas that are non-compliant with protected area standards are downgraded to ‘less than good’ status.

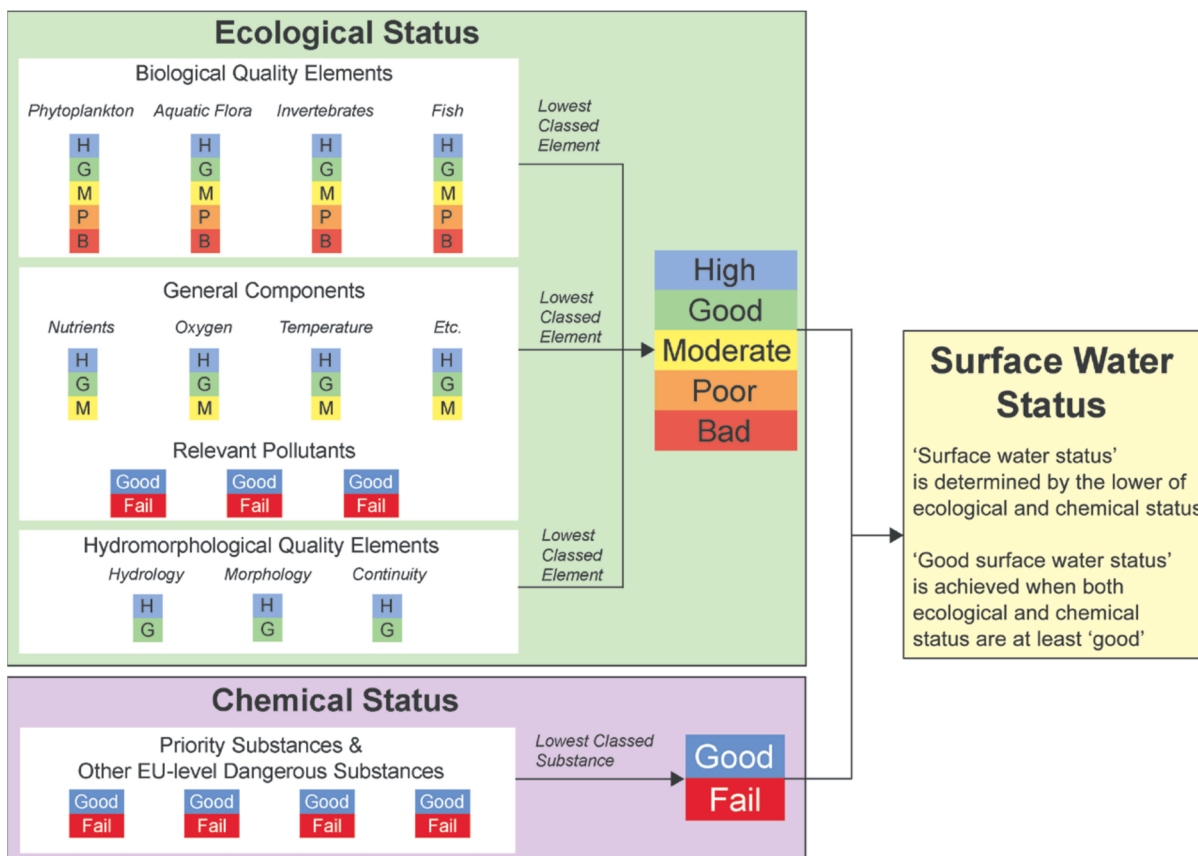


Figure 3-1: Elements of the Water Framework Directive Status

### 3.1 Catchment physical setting

Liffey and Dublin Bay catchment, within which the Project is located, the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km<sup>2</sup>. The largest urban centre in the catchment is Dublin City. The other main urban centres are Dun Laoghaire, Lucan, Clonee, Dunboyne, Leixlip, Maynooth, Kilcock, Celbridge, Newcastle, Rathcoole, Clane, Kill, Sallins, Johnstown, Naas, Newbridge, Athgarvan, Kilcullen and Blessington. The total population of the catchment is approximately 1,255,000. The Liffey catchment contains the largest population of any catchment in Ireland and is characterised by a sparsely populated, upland south eastern area underlain by granites and a densely populated, flat, low lying limestone area over the remainder of the catchment basin.

The subcatchments across which the 3FM Project is located include the Dodder\_SC\_010 for the development on the Poolbeg Peninsula and the Tolka\_SC\_020 for the works on the SPAR road on the northern side of the Liffey.

#### 3.1.1 Dodder\_SC\_010 subcatchment

This sub-catchment has a large variation in land cover types, with a dominance of peat bogs and forestry in the headwaters of the Dodder and Owenadoher main channels. As the watercourse progress downstream and enter the greater Dublin area, the land cover changes to urban fabric, with a large number of industrial, sports & leisure, construction and dumping sites throughout.

This is a large sub-catchment covering an area of 168km<sup>2</sup> sub-catchment made up of the Dodder main channel and its tributaries (Owenadoher), and two further independent watercourses in the Brewery Stream and River Poddle. These waters generally flow in a northerly direction before discharging to transitional coastal waters around Dublin. Given the vast extent of the urban and industrial development in the lower half of this catchment, a lot of the soils and sub-soils are classified as man-made, and so are susceptible to issues associated with diffuse urban run-off. The upper subcatchment is a mix of well and poorly drained soils, with extensive peat coverage at the top of the subcatchment. The sub-catchment is underlain by Poorly Productive and Locally Important (only moderately productive in localised areas) aquifers, hence the poor groundwater contribution to surface water flows.

### 3.1.2 Tolka\_SC\_020 subcatchment

There are three river waterbodies in this subcatchment which make up the lower reaches of the Tolka River main channel; the Tolka\_040, Tolka\_050 and Tolka\_060. The channel proceeds in an easterly direction before discharging into the Tolka Estuary at Drumcondra (East Wall). The Liffey Estuary Lower runs along the southern boundary of the subcatchment and receives water from the Tolka Estuary. It was identified as a heavily modified waterbody due to its use as a port which is discussed further in Section 3.3.

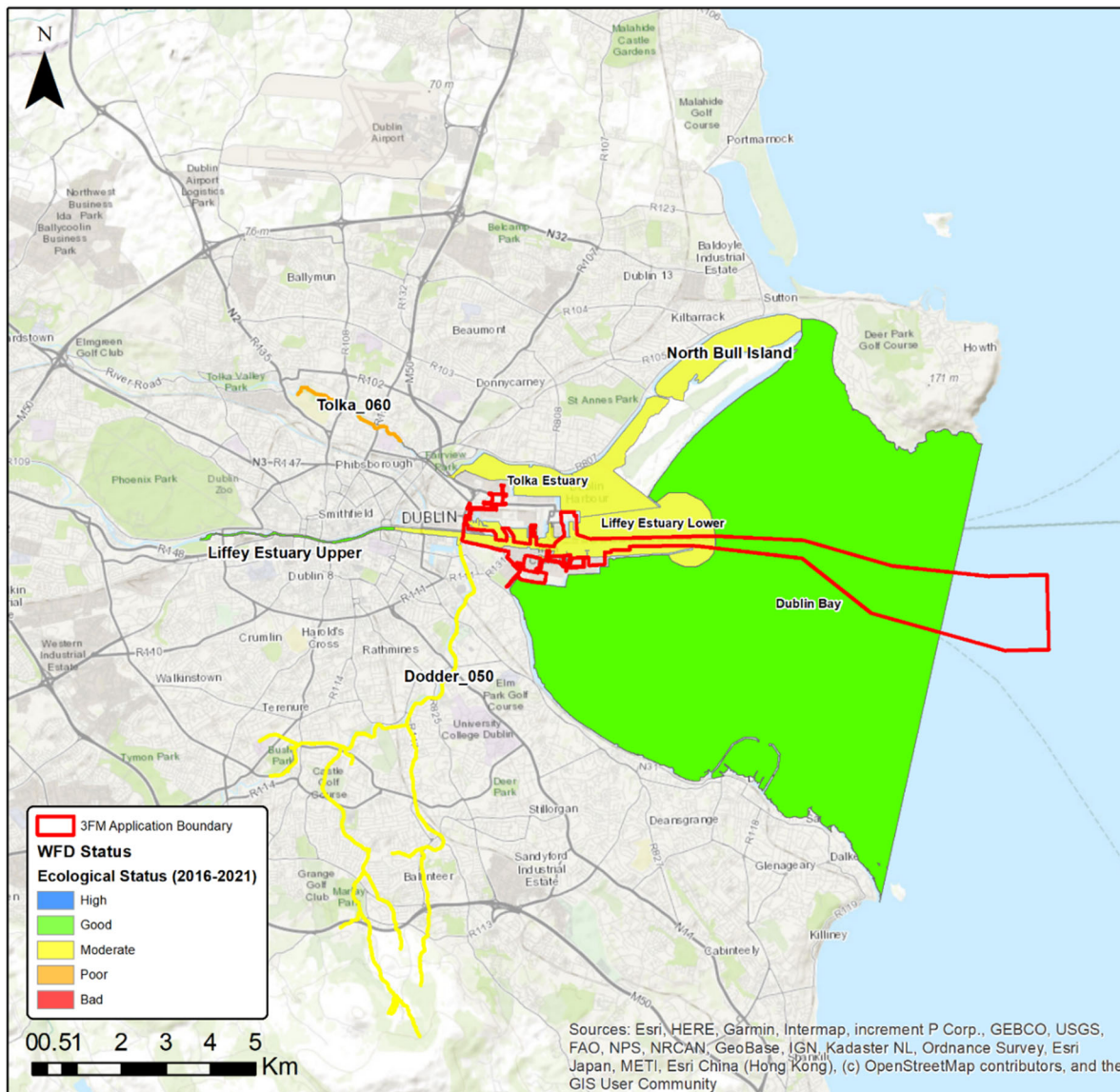
The predominant land cover throughout the sub-catchment is urbanisation (both continuous and discontinuous), with large areas of industrial development. This is a 61km<sup>2</sup> subcatchment which comprises the bottom reaches of the Tolka River, before discharging into the Tolka Estuary transitional waterbody. These lower reaches of the Tolka River would not be considered a flashy catchment in terms of hydrological response to rainfall. It is underlain by poorly productive aquifers throughout, with low sub-soil permeability on predominantly man-made areas of industrial and urban development. Pathways for pollutant transport in this sub-catchment are more likely concerned with drainage issues and potential misconnections throughout the urban and industrial areas.

## 3.2 WFD status classification

As outlined in Section 0, the 3FM Project is located within four surface water bodies, Liffey Estuary Lower Heavily modified water body, Dublin Bay coastal water body and the Dodder and Tolka river water bodies. There is hydrological connectivity to the Liffey Estuary Upper and Tolka Estuary transitional water bodies.

The 3FM Project lies within the 'Dublin Urban' groundwater body (EA-G-008). As outlined in Section 0 due to the nature of the 3FM Project and the relatively limited scale of geotechnical activities in the application area, there are no likely significant water quality effects on groundwater expected and these have therefore not been assessed further in this report.

Based on monitoring information and data from 2016 to 2021, the current WFD status classification of transitional and coastal water bodies potentially affected by the 3FM Project is illustrated in Figure 3-2.



**Figure 3-2 Water Framework Directive Water Body Status – Reported 2022**

The WFD status classification between 2007 and 2021 is shown in A further breakdown of the ecological and chemical elements used to determine status for the 2016-2021 WFD cycles is shown in Table 3 2.

Biological elements measured in the Liffey Estuary Lower water body are all at "moderate" status. Although the supporting oxygenation and nutrient conditions are "high" and "good" respectively, and the relevant pollutants "pass" their environmental quality standards, the overall Ecological Status is therefore "moderate."

Table 3-1 for each of these water bodies. In summary the Liffey Estuary Lower transitional water body has most recently been reported as "moderate" in 2021, and no change in status since the previous monitoring cycle. The Tolka Estuary transitional water body has most recently been reported as "poor" in 2021, a drop in status from 'moderate' in the previous monitoring cycle. The Dublin Bay coastal water body was reported as "good" in the 2016-2021 WFD monitoring cycle, a status which it has maintained since 2009. The Liffey Estuary Upper was reported as "good" in the 2016-2021 cycle, and this is an improvement from 'moderate' since the previous cycle.



A further breakdown of the ecological and chemical elements used to determine status for the 2016-2021 WFD cycles is shown in Table 3 2.

Biological elements measured in the Liffey Estuary Lower water body are all at "moderate" status. Although the supporting oxygenation and nutrient conditions are "high" and "good" respectively, and the relevant pollutants "pass" their environmental quality standards, the overall Ecological Status is therefore "moderate."

**Table 3-1: WFD Status (2007-2021)**

WFD Status 2007-2021	Liffey Estuary Lower	Liffey Estuary Upper	Tolka Estuary	Dublin Bay	Tolka_060	Dodder_50
	EA_090_0300	EA_090_0400	EA_090_0200	EA_090_0000	IE_EA_09T011150	IE_EA_09D010900
Overall WFD Status (2007-2009)	Moderate	Poor	Moderate	Moderate	Unassigned	Poor
Overall WFD Status (2010-2012 - Interim)	Good	Moderate	Moderate	Good	Unassigned	Moderate
Overall WFD Status (2010-2015)	Moderate	Moderate	Moderate	Good	Unassigned	Moderate
Overall WFD Status (2016-2021)	Moderate	Good	Poor	Good	Poor	Moderate

The Liffey Estuary Upper has shown further improvement with all biological and supporting chemistry elements measured achieving "good" status.

Biological elements reported for the Tolka Estuary in the 2016-2021 cycle, and the supporting chemistry have achieved "moderate" status. However, due to high biomass and extensive coverage of green algae on the mudflats, the overall Ecological Status, and thus WFD Quality Status, is given as "poor".

The overall WFD status (2016-2021) of the Tolka\_060 river water body is "poor". The 2016-2021 Ecological Status of the Tolka\_060 is also "poor". The Overall WFD Status of Dodder\_050 is "moderate" status for the period 2010-2021 having improved condition for that in the 2007-2009 cycle when it was classified at "poor" status.

Biological and supporting chemistry elements monitored in the Dublin Bay coastal water body range from "good" to "high" status. Overall Ecological Status is therefore "good" and unchanged from the previous monitoring cycle. In terms of chemical status two Poly Aromatic Hydrocarbons (PAHs) in Dublin Bay that are exceeding the environmental quality standards, benzo[a]pyrene and benzo[ghi]perylene, however these are failing across all water bodies monitored and are considered to be persistent ubiquitous substances. Ubiquitous substances are characterised by their ability to persist in the environment for many years, in some cases decades, even after their production has ceased or been greatly reduced. The list of ubiquitous substances includes, mercury and its compounds, PBDEs (brominated fire retardants), PAHs (polyaromatic hydrocarbons) and tributyltin (TBT) compounds.

**Table 3-2 WFD Status Breakdown (2016-2021)**

<i>WFD Status 2016-2021</i>			<i>Liffey Estuary Lower</i>	<i>Liffey Estuary Upper</i>	<i>Tolka Estuary</i>	<i>Dublin Bay</i>	<i>Tolka_060</i>	<i>Dodder_050</i>
			<i>EA_090_0300</i>	<i>EA_090_0400</i>	<i>EA_090_0200</i>	<i>EA_090_0000</i>	<i>IE_EA_09T011150</i>	<i>IE_EA_09D010900</i>
<i>Ecological Status</i>	<i>Biological Status</i>	<i>Phytoplankton Status</i>	<i>Moderate</i>	<i>Good</i>	<i>Moderate</i>	<i>High</i>	-	-
		<i>Other Aquatic Floras Status</i>	<i>Not Available</i>	<i>Not Available</i>	<i>Not Available</i>	<i>Good</i>	-	-
		<i>Invertebrate Status</i>	<i>Moderate</i>	<i>Not Available</i>	<i>Moderate</i>	<i>Good</i>	-	<i>Moderate</i>
		<i>Fish Status</i>	<i>Not Available</i>	<i>Not Available</i>	<i>Not Available</i>	<i>Not Available</i>	-	<i>Moderate</i>
	<i>Supporting Chemistry Conditions</i>	<i>Oxygenation Conditions</i>	<i>High</i>	<i>Good</i>	<i>Moderate</i>	<i>Good</i>	<i>Pass</i>	<i>Pass</i>
		<i>Nutrients Condition</i>	<i>Good</i>	<i>Good</i>	<i>Moderate</i>	<i>High</i>	<i>Good</i>	<i>Pass</i>
		<i>Relevant Pollutants</i>	<i>Pass</i>	<i>Not Available</i>	<i>Not Available</i>	<i>Pass</i>	<i>Not Available</i>	<i>Not Available</i>
	<i>Hydromorphological Quality Element</i>	<i>Hydrology, Morphology, Continuity</i>	<i>Not Available</i>	<i>Moderate</i>	<i>Good</i>	<i>Good</i>	<i>Not Available</i>	<i>Not Available</i>
	<b><i>Ecological Status (2016 – 2021)</i></b>		<b><i>Moderate</i></b>	<b><i>Good</i></b>	<b><i>Poor</i></b>	<b><i>Good</i></b>	<b><i>Poor<sup>1</sup></i></b>	<b><i>Moderate</i></b>
	<i>Chemical Status</i>	<b><i>Chemical Status (2016 – 2021)</i></b>	<b><i>Good</i></b>	<b><i>Not Available</i></b>	<b><i>Not Available</i></b>	<b><i>Failing to achieve good</i></b>	<b><i>Not Available</i></b>	<b><i>Good</i></b>
<b><i>Overall WFD Quality Status 2016 - 2021</i></b>			<b><i>Moderate</i></b>	<b><i>Good</i></b>	<b><i>Poor</i></b>	<b><i>Good</i></b>	<b><i>Poor</i></b>	<b><i>Moderate</i></b>

<sup>1</sup> Ecological status is assigned based on modelling undertaken by the EPA

Given the widespread pervasive nature of these compounds and the relatively low EQS concentrations, exceedances of EQSs in water bodies are common. Reducing concentrations of these substances in water bodies is extremely challenging. In presenting information on chemical status, results can be presented with and without ubiquitous substances. This is done to ensure that improvements achieved with other substances, which can be addressed through local and national programmes of measures, are not obscured by including uPTBs. Assessment of chemical status in this way does not exempt Ireland from taking additional measures, including at international level, to reduce or eliminate discharges and emissions of uPTBs

The key focus of this assessment was to ensure that the 3FM Project will not result in a deterioration in the current WFD status of the water bodies within the study area, based on the 2016-2021 WFD monitoring programme as reported by the EPA, and also to ensure that the project does not compromise the achievement of the WFD objectives for the improvement in the overall status of these water bodies. The assessment also considers the protected areas linked to the water bodies in question and ensures that the protected area objectives are also unaffected.

### 3.3 Heavily Modified Water Body Designation

#### 3.3.1 Designation

Heavily modified waterbodies which are bodies of surface water which have been substantially changed in their hydromorphological character for the purposes of a specified use. The hydromorphological condition of water bodies has commonly been significantly modified by human intervention for various specified uses, such as for navigation, land drainage, hydroelectric power generation and water supply. The environmental objectives for HMWBs recognise that the extent of the modifications mean that the conditions are not consistent with those required for Good Ecological Status, and that the impacts cannot be fully mitigated without impacting on the specified use.

The specified uses, and the criteria for designation, are set out in Article 4(3) of the Directive. A waterbody can be designated as a HMWB if:

- a. the changes to the hydromorphological characteristics of that body which would be necessary for achieving Good Ecological Status would have significant adverse effects on:
  - i. *the wider environment;*
  - ii. *navigation, including port facilities, or recreation;*
  - iii. *activities for the purposes of which water is stored, such as drinking-water supply, power generation or irrigation;*
  - iv. *water regulation, flood protection, land drainage, or*
  - v. *other equally important sustainable human development activities;*
- b. the beneficial objectives served by the artificial or modified characteristics of the water body cannot, for reasons of technical feasibility or disproportionate costs, reasonably be achieved by other means, which are a significantly better environmental option. Such designation and the reasons for it shall be

specifically mentioned in the river basin management plans required under Article 13 and reviewed every six years.

The structures and changes to channel and bed morphology required for a water body to be used for Navigation and Ports are typical of the type of modifications that result in the designation of a water body as heavily modified. The Lower Liffey Estuary has been designated a HMWB since the first river basin management cycle due to navigation for the purposes of Dublin Port with the key hydromorphological/physical change driven by the specified use identified as dredging and shoreline alterations.

The draft River Basin management Plan 2022-2027<sup>2</sup> acknowledged that “Initial evidence indicates that there are more waterbodies that have been heavily modified than has previously been designated to date, both within the specified use categories included in the first cycle, and in some of the other specified use categories not previously considered.

The RBMP also states

*“It is important to reiterate, that waterbodies with a heavily modified designation are still expected to meet the required standards for all the other water quality elements, with measures to mitigate to the greatest extent possible the hydromorphological impacts also required.”*

As highlighted in the Review of Ireland’s Heavily Modified Water Body Designations for the Third Cycle River Basin Management Plan (EPA, 2022):

*“Waterbodies that are designated as heavily modified have a WFD environmental objective of Good Ecological Potential rather than Good Ecological Status. The designation means that a realistic objective is set that acknowledges that the water body has been physically altered for a specified use that society needs to be continued. The physical modifications caused by the use need to be mitigated against as far as possible, whilst acknowledging that the specified use needs to be retained. For example, a fish pass designed to best practice standards might be required on an instream barrier to ensure fish passage”*

In the EPA review the designation tests required for the designation of Transitional and Coastal Water bodies as heavily modified, as required under Article 4(3), were applied. The Lower Liffey Estuary retains its designation as Heavily Modified Water Body for the third cycle of the RBMP as it remains substantially changed in terms of its hydromorphology and will not achieve good ecological status due to these changes. The EPA concluded that there are no restoration measures available that would not impact on the specified use, i.e., navigation and ports and there are no alternative options which are a significantly better environmental option, technically feasible and not disproportionately costly (EPA 2022).

The Lower Liffey Estuary is therefore one of 13 transitional and coastal water bodies that has been recommended as heavily modified water body under the “navigation and urban uses” specified use category.

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<sup>2</sup> <https://www.gov.ie/en/consultation/2bda0-public-consultation-on-the-draft-river-basin-management-plan-for-ireland-2022-2027/>

In addition, the draft RBMP also includes the Upper Liffey Estuary transitional water body as a candidate HMWB due to navigation and urban specified uses again due to dredging and shoreline alterations. The Dodder\_50 and Tolka\_060 river water bodies are also designated as candidate HMWBs with a specified use of flood protection and urban with the significant changes in hydromorphology due to urban pressures (Longitudinal connectivity (Sediment); Lateral connectivity (River corridor); Lateral connectivity (Bank protection); Lateral connectivity (Floodplain)) and Flood Protection pressures (Lateral connectivity (Bank protection)). At this stage the 3<sup>rd</sup> River Basin Management Plan has not been published therefore these water bodies remain as candidate HMWBs.

### 3.3.2 Good Ecological Potential

Waterbodies that are designated as heavily modified have a WFD environmental objective of Good Ecological Potential rather than Good Ecological Status. The designation means that a realistic objective is set that acknowledges that the water body has been physically altered for a specified use that society needs to be continued. The physical modifications caused by the use need to be mitigated against as far as possible, whilst acknowledging that the specified use needs to be retained.

Therefore, the designation of the Liffey Estuary Lower as a HMWB means that mitigation measures will need to be applied to address hydromorphological pressures as far is practical whilst still retaining the specified use of the water body, i.e. navigation and ports.

What good ecological potential will represent in the HMWB designations will be a decision for the EPA and whilst hydromorphological supporting conditions will be mitigated to the greatest extent possible through the application of mitigation measures, HMWBs will still be expected to meet the required standards for other water quality elements.

Ireland intends to undertake the “*Mitigation (Prague) Approach*” in the establishment of good ecological potential, i.e. a mitigation measures-based approach used by many Member States. Under this system a heavily modified waterbody is considered to be at Good Ecological Potential (GEP) when it has

1. the relevant mitigation measures in place? The recommendation here is to use the EU mitigation measures library for surface waters;
2. achieved Good (or better) condition for the monitored biological quality elements (BQE) that are not sensitive to the hydromorphological modification.
3. achieved the physico-chemical conditions equivalent to Good Ecological Status, except where parameters are impacted by the hydromorphological alteration caused by the specified use; and
4. achieved the best state previously achieved since the modification for the monitored biological quality elements that are sensitive to the hydromorphological modification, where those data are available.

### 3.3.3 Mitigation Measures

A review of the European Commission's Joint Research Centre's report on a common understanding of using mitigation measures for reaching good ecological potential for heavily modified water bodies was undertaken (Halleraker et al., 2016).

The WFD definition of maximum ecological potential for a HMWB are "*The hydromorphological conditions are consistent with the only impacts on the surface water body being those resulting from the artificial or heavily modified characteristics of the water body once all mitigation measures have been taken to ensure the best approximation to ecological continuum, in particular with respect to migration of fauna and appropriate spawning and breeding grounds*"

This approach is initially less reliant on an ecology-hydromorphology link, which is currently poorly defined due to the lack of scientific knowledge linking the responses of biological quality elements to specific hydromorphology pressures, and GEP is defined based on the implementation of mitigation measures.

Firstly, all appropriate mitigation measures that do not have a significant adverse effect on the specified use are identified, and Maximum Ecological Potential (MEP) is defined by estimating, using expert judgment, what biological values are to be expected following the implementation of the measures.

Next the measures that are deemed to lead to only slight improvements in values of the Biological Quality Elements (BQEs) are removed.

The remaining measures are then seen as the possible mitigation measures for GEP.

Ideally, the biological values for GEP are then defined once these measures have been put in place. The true biological values for GEP can only be derived, however, when links between hydromorphology and biology are known, in the absence of this knowledge, GEP is solely defined on the basis of the mitigation measures defined using this approach.

To this end the review of the Mitigation Measures Library from the CIS Guidance Document 37 *Steps for defining and assessing ecological potential for improving comparability of Heavily Modified Water Bodies (EC, 2019)* revealed that there are 12 mitigation measure categories that are relevant across EU Member States, including Ireland and for which a tool box of measures have been developed to address hydromorphological pressures as far is practical whilst still retaining the specified use of the water body. These mitigation measures categories and some examples of measures within each category are provided in Table 3-3.

These measures which are included in the mitigation libraries of many Member States and measures being implemented in Ireland are consistent with the approaches being adopted throughout Europe to mitigate hydromorphological impacts as best as possible. Whilst this mitigation may not result in the achievement of good supporting hydromorphological conditions, the Lower Liffey Estuary is currently at moderate hydromorphological supporting conditions, they will ensure that measures are being undertaken to ensure the achievement of good ecological potential.

The WFD assessment will assess how the 3FM Project will contribute to the implementation of these mitigation measures and to contribute to the environmental objective of the Liffey Estuary Lower which is good ecological potential by 2027.

**Table 3-3: Mitigation Measure Categories**

Key groups of measures	Examples of specific measures to reach GEP
Improve morphological and/or habitat diversity of seabed	<ul style="list-style-type: none"> <li>- Placement of rocks, artificial reefs etc. to form reef and/or other types of habitats for BQEs</li> <li>- Use breakwaters or groynes or shore parallel islands to create local variations in depth, exposure/shelter, etc.</li> <li>- Local deepening by dredging or excavation where sustainable</li> </ul>
Intertidal habitat restoration, enhancement or creation	<ul style="list-style-type: none"> <li>- Habitat rehabilitation</li> <li>- Managed realignment to new line</li> <li>- Re-open polders; setback (to higher ground; to existing secondary defence line)</li> <li>- Step back (create intertidal shelf against vertical wall)</li> <li>- Planter baskets; other planting initiatives</li> <li>- Improve creek or backwater habitats</li> <li>- Use breakwaters, shore parallel islands or similar to create sheltered conditions promoting intertidal enhancement</li> <li>- Offsetting measures e.g., spawning habitat for fish</li> </ul>
Beach or foreshore replenishment	<ul style="list-style-type: none"> <li>- Replenish with natural materials to allow the restoration or enhancement of degraded intertidal or shallow subtidal substrates/habitats; to raise elevation to provide a buffer against wave energy</li> </ul>
Sediment management	<ul style="list-style-type: none"> <li>- Sediment bypassing, move sediment from behind breakwater, dam, jetty, terminal groyne, etc. and (re)place in natural system to address downstream/downdrift erosion (habitat loss or degradation)</li> <li>- Sever root of groyne, breakwater, etc. to reinstate longshore sediment transport</li> </ul>
Beneficial use of dredged material	<ul style="list-style-type: none"> <li>- Where dredging for navigation or flood conveyance purposes results in a waste to be disposed, seek opportunities to use material beneficially, for sediment supplementation, habitat enhancement, etc., directly through placement (e.g., rainbowing) or indirectly via a feeder berm or water column recharge</li> <li>- Also: can use other waste products e.g. oyster shells to create berms or banks as habitat/buffer</li> </ul>
Modification or management of operations or structures e.g., sluices, vessel traffic	<ul style="list-style-type: none"> <li>- Remove redundant infrastructure</li> <li>- Modify operation of lock, sluice or other structure to facilitate fish passage or to maintain desired salinity levels</li> <li>- Retrofit if necessary to enable above</li> <li>- Use fluid mud navigation / dynamic underkeel clearance where safe to do so</li> <li>- Explore use of SMART technology for vessel traffic management</li> <li>- Speed limits to reduce wash-induced erosion</li> </ul>
Soft engineering solutions; use of vegetation	<ul style="list-style-type: none"> <li>- Seeding, planting, transplanting e.g., dune or marsh vegetation, reedbeds</li> <li>- Protective structure such as brushwood groynes, sediment filled geotubes</li> <li>- Rip rap or eco-blocks rather than concrete or steel</li> </ul>
Realign to mitigate effects on flow	<ul style="list-style-type: none"> <li>- Construct structures to normalise flow; realign breakwater, frontage, etc.</li> <li>- Lower or sever root of groyne or breakwater</li> <li>- Reduce wave reflection; increase wave absorption</li> <li>- Build culverts in breakwaters, groynes, etc.</li> <li>- Introduce e-flow</li> </ul>
Reprofile embankments, structures	<ul style="list-style-type: none"> <li>- Naturalise profile to support habitat development or enhancement</li> <li>- Step back</li> </ul>
Fish pass	<ul style="list-style-type: none"> <li>- Install fish or eel pass, ladder or similar at sluices or water level control structures</li> </ul>
Seasonal or tidal constraints on activity	<ul style="list-style-type: none"> <li>- Constraints on maintenance activities or other works during breeding/spawning season or fish migration periods; low oxygen</li> <li>- Working on flood or ebb tide to avoid impacts on sensitive adjacent habitats or species</li> <li>- Programme vegetation cutting or clearance</li> </ul>
Selection of methods or equipment	<ul style="list-style-type: none"> <li>- Select dredging method to retain sediment in system or to avoid raising suspended sediment levels</li> <li>- Use silt curtain</li> <li>- Manage overspill</li> <li>- Selective cutting or clearance e.g., only along one bank</li> <li>- Use long arm excavator to avoid disturbing or damaging sensitive habitats; to retain riparian vegetation</li> <li>- Strip dredging (for aggregate) to facilitate recolonisation</li> </ul>

### **3.3.4 Biological quality elements (BQE) that are not sensitive to the hydromorphological modification**

In the case of the Liffey Estuary Lower the most recent biological monitoring has revealed that the monitoring undertaken as part of the WFD monitoring programme include biological elements that are predominantly sensitive to organic and nutrient enrichment, but not hydromorphology, which are largely achieving conditions which are consistent with good ecological status for these BQEs. It will be important to ensure that the additional alterations proposed under the 3FM Project and the mitigations that will be required to address hydromorphological pressures and achieve GEP do not cause a deterioration in these biological elements.

### **3.3.5 Physico-Chemical Conditions**

Alteration of general physico-chemical conditions downstream of major hydromorphological alterations can occur (e.g. temperature, dissolved oxygen supersaturation). Based on the current WFD monitoring programme and the latest monitoring for general physico-chemical conditions this type of impact is not evident within the Liffey Estuary Lower and therefore the specified use for this HMWB, navigation, is not having a significant impact on physico chemical conditions.

### **3.3.6 Biological quality elements that are sensitive to the hydromorphological modification**

The Mitigation Measures Library (EU CIS Guidance No. 37) library was consulted for TraC water bodies to determine the likely effects of a particular pressure on the ecological conditions of a water body. The key biological elements that are sensitive to hydromorphological alterations associate with the 3FM Project, i.e. Quay walls, vertical piling, and dredging are fish, benthic invertebrates, angiosperms and macroalgae.

Angiosperms and macroalgae are not typically part of the habitat types in the vicinity of the proposed development, nor is there monitoring information available. However, fish and benthic invertebrates have the potential to be affected by these morphological alterations. The latest monitoring information available for fish in the Lower Liffey Estuary was for the 2010-2015 WFD monitoring period when the status was considered to be moderate. However, prior to this in the 2007-2009 and the 2010-1012 monitoring period the status was considered to be good even though the hydromorphological supporting conditions were considered to be moderate over these same monitoring periods. This suggests that more recent deterioration in fish status is as a result of other types of pressures rather than the morphological pressures associated with navigation. Notwithstanding this the 3FM Project must ensure that there is no potential to prevent fish from achieving the best state previously achieved since the modification. The same is applicable for benthic invertebrates which achieved a high status classification in the 2010 – 2015 monitoring period.

## **3.4 Register of Protected Areas**

A significant proportion of the area of Dublin Bay and adjacent coastline is protected under existing EU legislation requiring special protection due to the sensitivity to pollution or particular environmental importance. All of the areas requiring special protection in the Irish River Basin District have been identified by EPA,



mapped and listed in a national register of protected areas (required under Article 6 of the WFD). The register of protected areas includes:

- areas designated for the abstraction of water for human consumption (Drinking Water Protected Areas);
- areas designated for the protection of economically significant aquatic species, i.e. Freshwater Fish and Shellfish;
- bodies of water designated as recreational waters, including areas designated as bathing waters;
- nutrient-sensitive areas, including areas identified as Nitrate Vulnerable Zones under the Nitrates Directive or areas designated as sensitive under Urban Waste Water Treatment Directive; as well as
- areas designated for the protection of habitats or species where the maintenance or improvement of the status of water is an important factor in their protection including relevant Natura 2000 sites (Special Protection Areas (SPAs); and Special Areas of Conservation (SACs)).

These protected areas have their own monitoring and assessment requirements to determine their condition. They are often assessed for additional pollutants or requirements relevant to their designation. Protected areas within the Dublin Port and Dublin Bay area include areas of Bathing Water, Nutrient Sensitive Waters and Natura 2000 sites.

### 3.4.1 Bathing Waters

The Bathing Water Directive (2006/7/EC) came into force in March 2006, and was transposed into Irish law by the Bathing Water Quality Regulations, 2008, as amended. The previous 1976 Directive was repealed with effect from 31 December 2014. Since 2014, the annual water quality classification (rating) of a beach or lake has been based on water quality results covering a four-year period rather than a single previous season’s data. Water quality at beaches and lakes is classified as Excellent; Good, Sufficient or Poor (Table 3-4). This approach is common across all EU Member States and there is a requirement to ensure that bathing waters are of ‘Sufficient’ standard or better. Any ‘Poor’ bathing water requires a programme of adequate management measures to be implemented. A minimum of 16 samples are required for formal annual assessment.

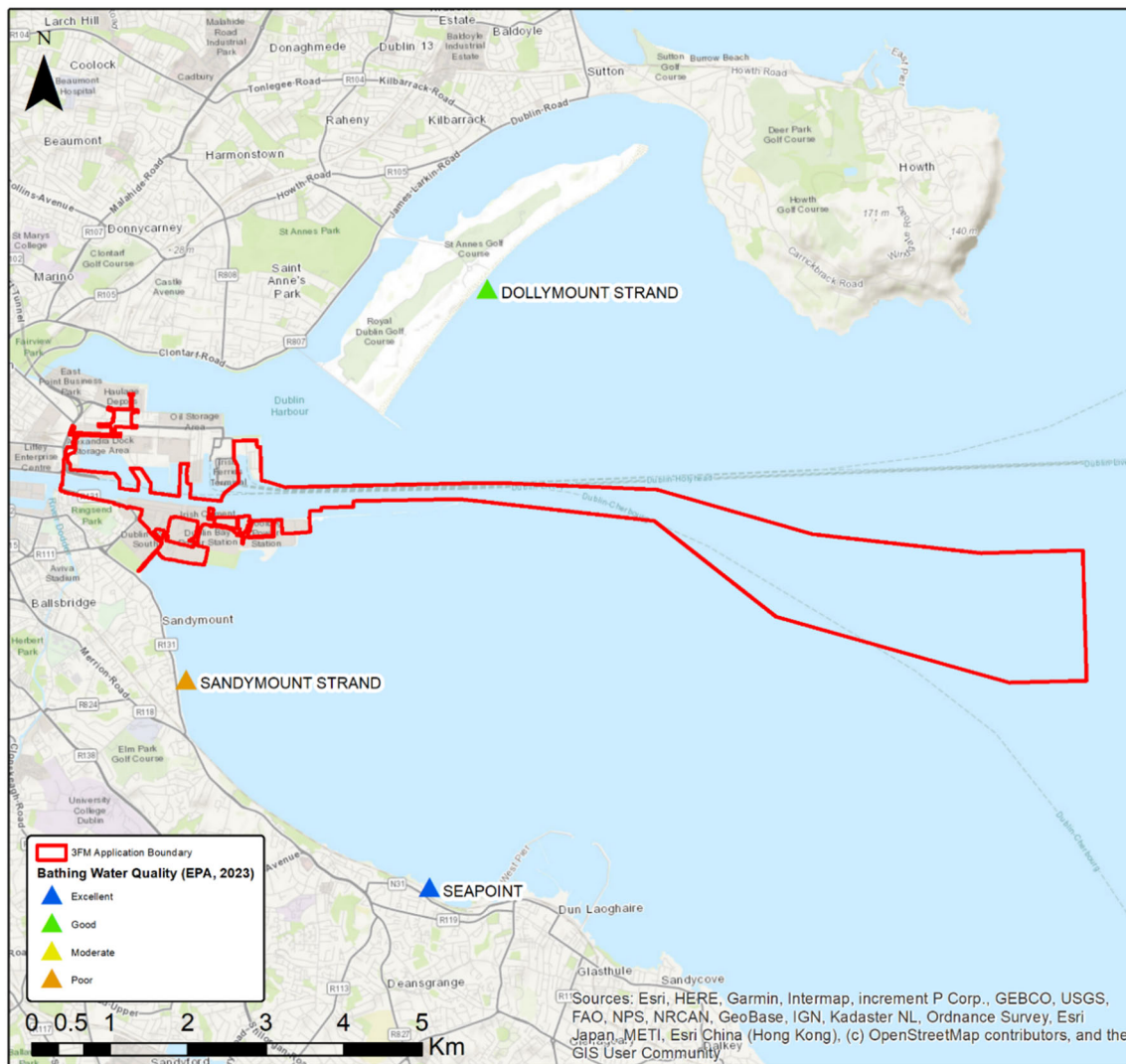
**Table 3-4 Annual Assessment Criteria for Bathing Waters**

Parameter	Excellent	Good	Sufficient
E. coli (Freshwater)	500*	1000*	900**
E. coli (Coastal)	250*	500*	500**
Intestinal enterococci (freshwater)	200*	400*	330**
Intestinal enterococci (Coastal)	100*	200*	185**

\*based on 95-percentile value

\*\*based on 90-percentile value

The regulated bathing areas identified in the immediate vicinity of the 3FM Project are Dollymount Strand, Sandymount Strand, and Seapoint. The most recent bathing water classification is for 2023, and Dollymount Strand has been classified as Good; Sandymount Strand has been classified as Poor; and Seapoint has been classified as Excellent (Figure 3-3).



**Figure 3-3 Bathing Water Status in the Dublin Area 2023 (EPA, 2024)**

The main sources of pollution resulting in the Poor classification in Sandymount Strand are misconnections and sewage overflows which contaminate streams flowing to the bathing water, dog fouling left on the beach, and birds. The Dublin Bay Bathing Water Taskforce (chaired by Dublin City Council) was established in 2019 to help identify and fix pollution sources impacting on bathing water quality in Dublin Bay, including Sandymount Strand. Programs to identify and fix misconnections are ongoing by the local authority. Uisce Éireann has made significant improvements to the wastewater network and work is ongoing to address urban wastewater pressures.

The results for individual samples at all sites in the vicinity of the 3FM Project monitored during 2023 are shown in Table 3-5. They show that the great majority of sample results indicated Excellent quality.

**Table 3-5 Summary Status of Samples during the 2023 Monitoring Season**

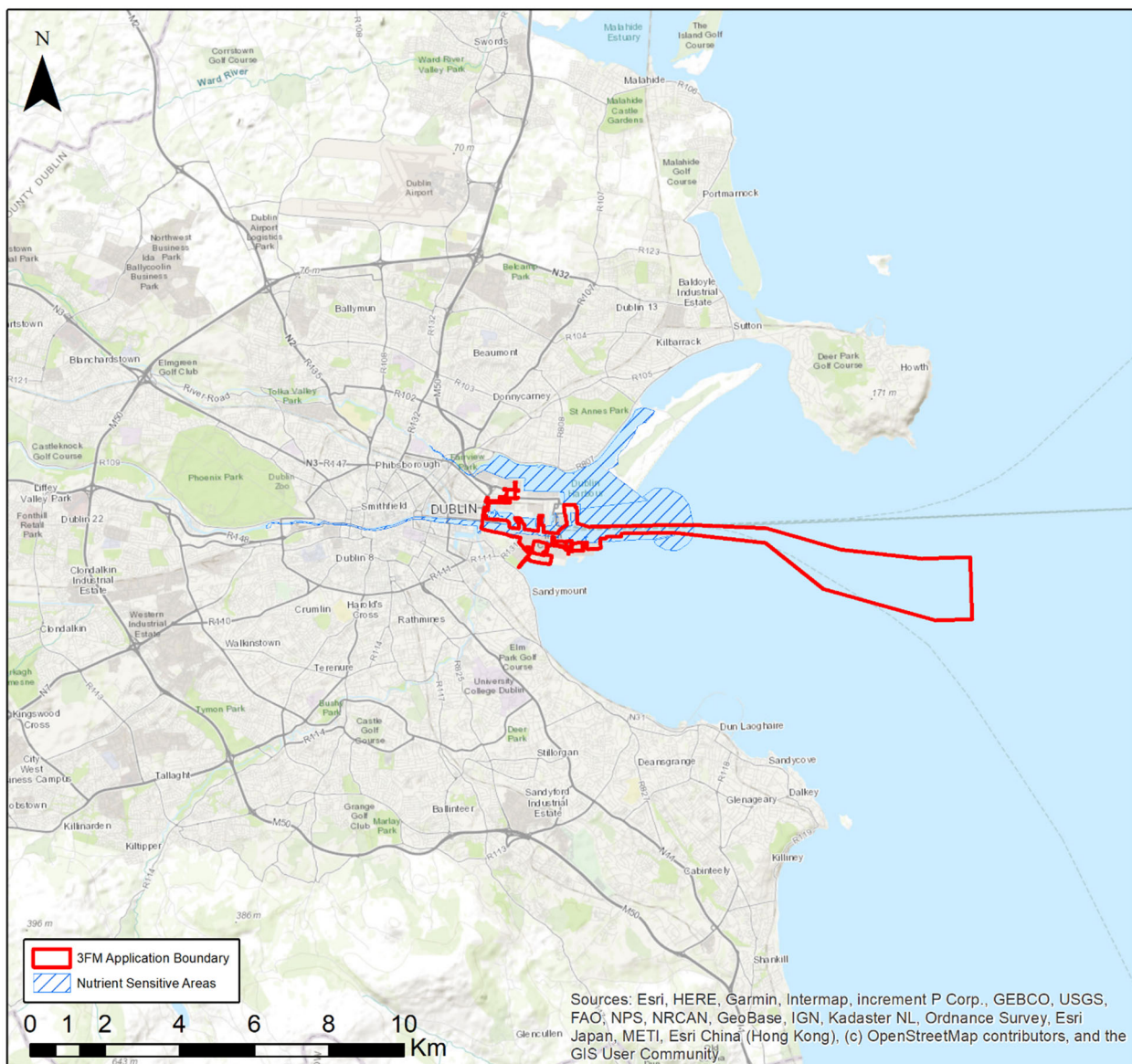
Sample Date	Dollymount Strand	Sandymount	Seapoint
22/05/2023	E	E	
25/05/2023-30/05/2023			E
06/06/2023	E	E	E
12/06/2023	G	E	E
18/06/2023-20/06/2023	G	E	E
26/06/2023-28/06/2023	E	G	E
03/07/2023	E	E	E
10/07/2023-11/07/2023	E		E
17/07/2023	E	E	E
23/07/2023-24/07/2023	E	E	E
30/07/2023-31/07/2023	G	S	E
01/08/2023	P	S	
07/08/2023-08/08/2023	E	E	E
14/08/2023-15/08/2023	E	E	E
20/08/2023-21/08/2023		E	E
28/08/2023-29/08/2023	E	G	E
03/09/2023-04/09/2023	E	E	E
11/09/2023	E	G	E

**Key:** Blue: Excellent; Green: Good; Yellow: Sufficient; Orange: Poor

### 3.4.2 Nutrient Sensitive Waters

The Urban Waste Water Treatment Regulations 2001, as amended, which transpose the Urban Wastewater Treatment Directive (91/271/EEC) into Irish law and update the Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations 1994, as amended, list nutrient sensitive waters in the Third Schedule.

The Liffey Estuary from Islandbridge weir to Poolbeg Lighthouse, including the River Tolka basin and South Bull Lagoon has been designated as a nutrient sensitive area (Figure 3-4). Ringsend WWTP currently discharges in the Lower Liffey Estuary and is in the List of Priority Urban Areas (Uisce Éireann, 2024) where treatment must improve to resolve national environmental priorities. Upgrade of the treatment plant is proposed for completion by 2025.



**Figure 3-4 Nutrient Sensitive Areas**

### 3.4.3 Natura 2000 Protected Areas

Natura 2000 is a European network of important ecological sites. The EU Habitats Directive (92/43/EEC) places an obligation on Member States of the EU to establish the Natura 2000 network. The network is made up of Special Protection Areas (SPAs), established under the EU Birds Directive (79/409/EEC), and SACs, established under the Habitats Directive itself.

As illustrated in Figure 3-5, the majority of the 3FM Project does not fall within any Natura 2000 site (i.e. SPA or SAC), however the licensed dumping area is within the Rockabill to Dalkey SAC which is designated for the marine Annex I qualifying interest reefs, and the Annex II species *Phocoena phocoena* (harbour porpoise).

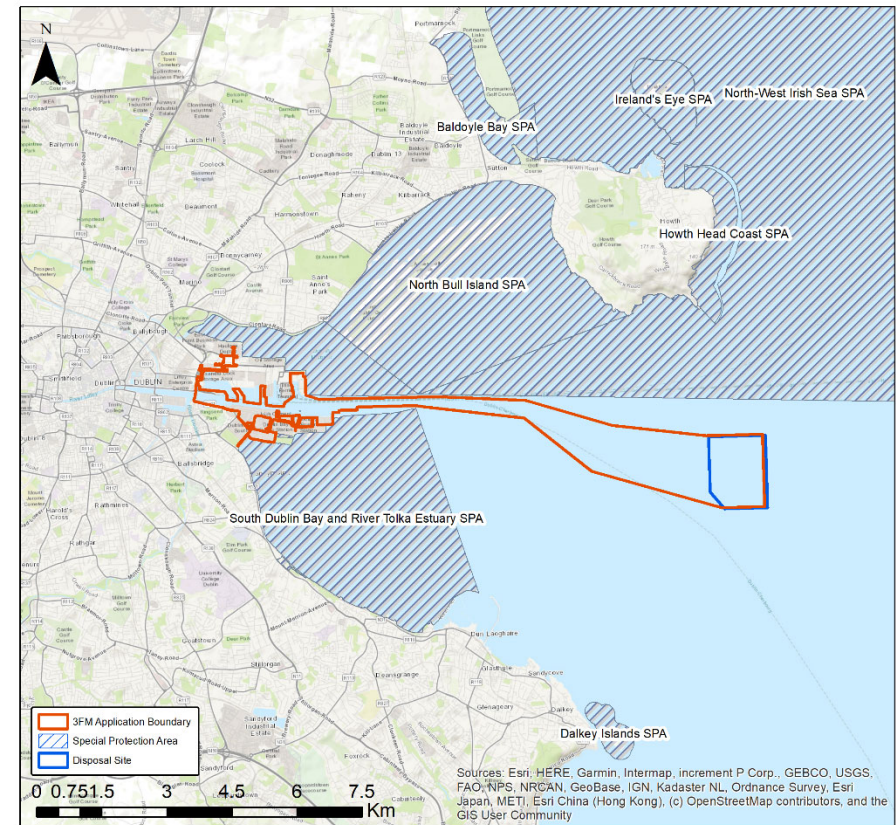
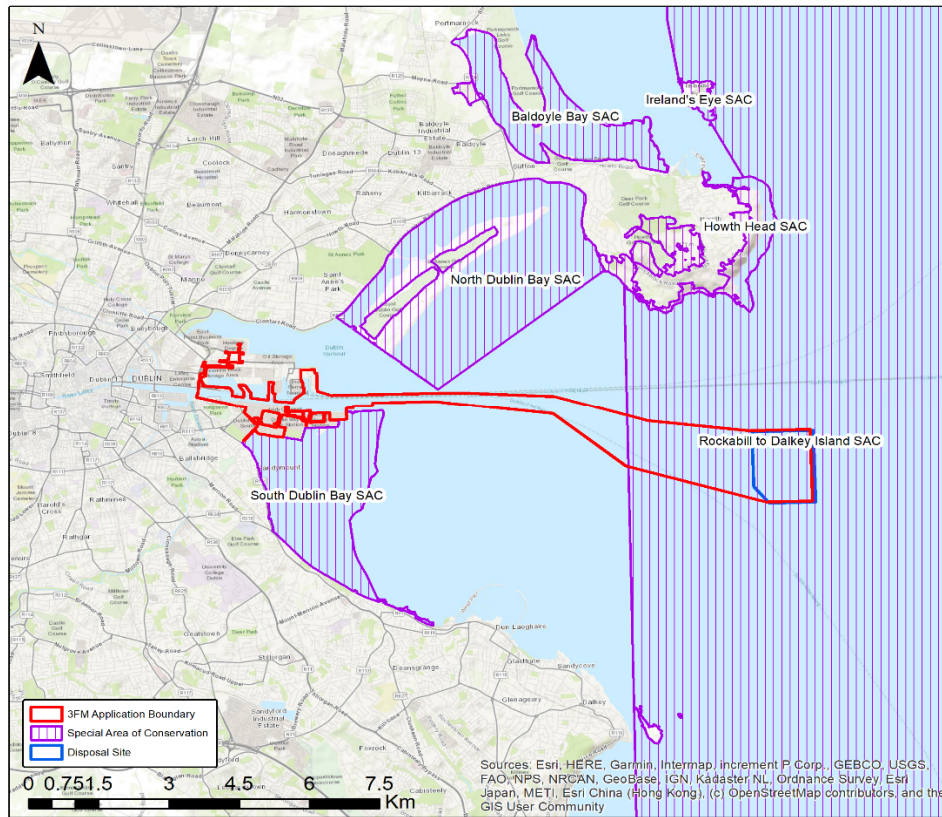


Figure 3-5: Natura 2000 Designated Sites

## 4 PROJECT DESCRIPTION

A detailed description of each element of the 3FM Project is presented in Chapter 5 of the EIAR and on the Planning Drawings. A General Arrangement Drawing illustrating the main elements of the 3FM Project is presented in Figure 4-1. The 3FM Project has six key elements:

1. A new public road and bridge called the Southern Port Access Route (SPAR) to link the north and south port areas.

The route will include a new bridge over the River Liffey. It will be located immediately east of Tom Clarke Bridge and north of the R131. The route will facilitate Heavy Goods Vehicles (HGVs), active travel users (pedestrians, cyclists, wheelers etc), blue light services and public transport users moving to and from the South Port and Poolbeg Peninsula. The SPAR will allow the 3FM Project to be rail enabled through rapid road shunting of freight from the South Port, across the Liffey, to rail intermodal facilities in the North Port vicinity. The SPAR will have a direct connection to the Dublin Tunnel (aka Dublin Port Tunnel) via the North Port road system.

2. A new Lift-on Lift-off (Lo-Lo ) container terminal with an annual throughput capacity of 550,000 Twenty-foot Equivalent Units (TEU) or 5.34m tonnes.

The Lo-Lo container terminal will consist of two main components:

- a. A terminal located north of the ESB's Generating Station on the eastern end of Poolbeg Peninsula. The terminal will have 650m of deep water berthage dredged to a depth of -13.0m CD (Chart Datum), plus associated cargo handling areas (Dublin Port Masterplan Area N, see Figure 4-1). This terminal will accommodate Lo-Lo vessels of up to 240m length overall, primarily from continental Europe, on a new open-piled wharf. The works will require the demolition of the existing Poolbeg Oil Jetty which will be replaced by a new oil transfer facility at the eastern end of the wharf.
  - b. Transit container storage yard located on waterside land currently used for bulk cargo handling (Dublin Port Masterplan Area L, see Figure 4-1).
3. Replacement of the existing Lo-Lo container terminal, currently operated by Marine Terminals Limited (MTL), with a new Roll-On Roll-Off (Ro-Ro) freight terminal with an annual throughput capacity of 360,000 Ro-Ro units or 8.69m tonnes.

The Ro-Ro freight terminal will consist of two main components:

- a. Terminal located at existing Berths 42 – 45 including provision of two berths, each with a single tier Ro-Ro ramp, plus associated cargo handling facilities (Dublin Port Masterplan Area K, see Figure 4-1).
- b. Terminal located on Port owned land on the southern side of the Poolbeg Peninsula (Dublin Port Masterplan Area O, see Figure 4-1).

This combined terminal will accommodate larger Ro-Ro vessels of up to 240m length, primarily from Continental Europe.

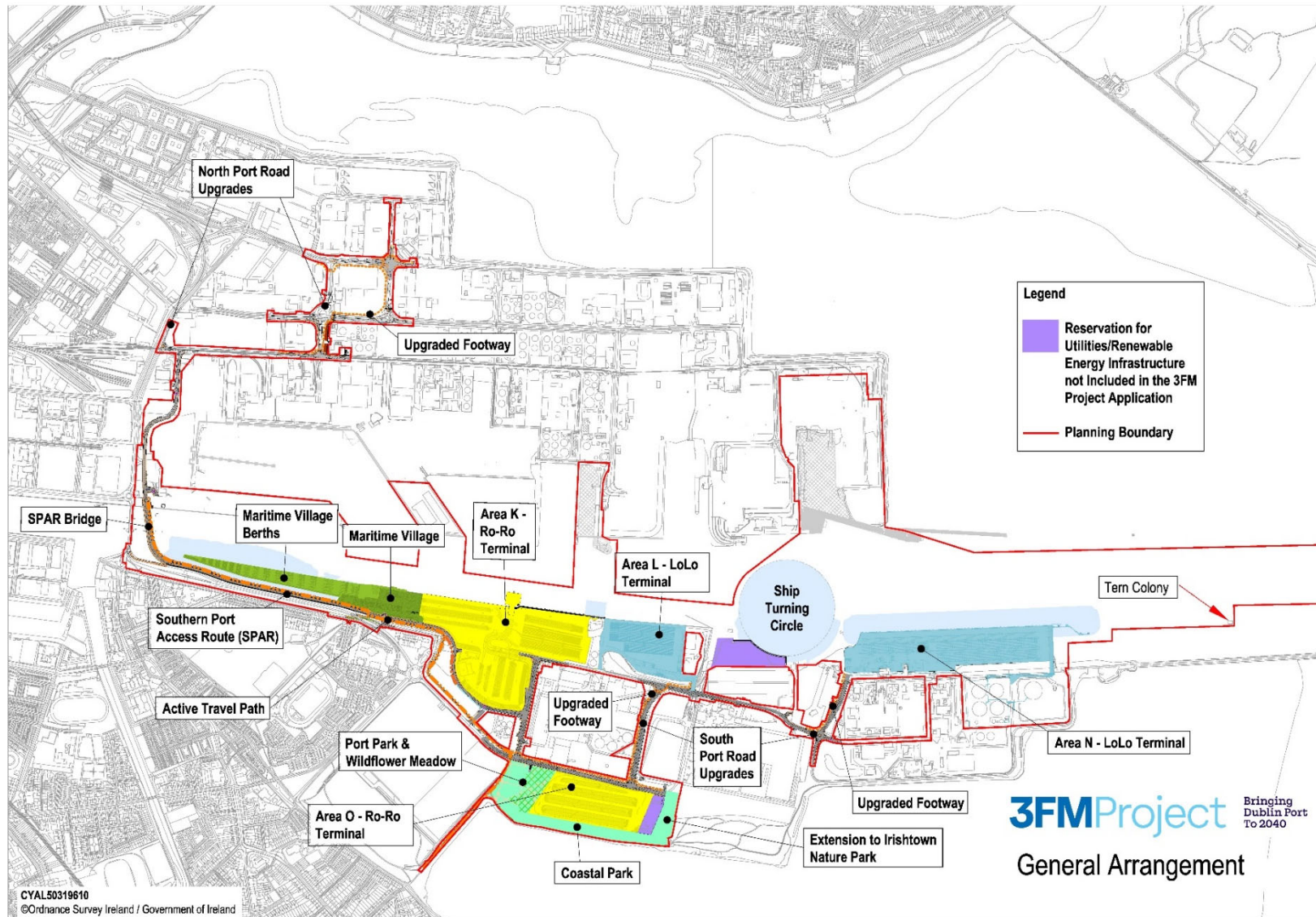


Figure 4-1: Proposed 3FM Project infrastructure works

4. Provision of a 325m diameter ship turning circle in the river channel north of Pigeon House Harbour, dredged to a depth of -10.0m CD. The ship turning circle will enable safe navigation and efficient manoeuvring of vessels up to 240m in length.

5. Maritime Village

Development of a new Maritime Village at Pigeon House Road and Berth 41. This village will accommodate local rowing, sailing, and boat clubs and will provide a significantly enhanced public realm and facilities on the waterside. It will also accommodate the relocation of Port Harbour Operations from the North Port.

6. Community Gain

Integrating Dublin Port with Dublin City and its people is a core objective of the Masterplan for Dublin Port. Development of proposed new public amenities on the Poolbeg Peninsula as part of the 3FM Project will provide community gain and contribute towards integrating the port with the city. These include:

Enhanced recreational amenity through:

- a. 4.6km of Active Travel Path (cycle, pedestrian, wheelers etc) and 2.6km of new or upgraded footway for the SPAR and Poolbeg Peninsula, which will link with the 1.4km Liffey Tolka Greenway in the North Port, and from there to the 4.0km Tolka Estuary Greenway currently under construction by Dublin Port. DPC will provide Dublin City Council with a €5million contribution for future upgrading of the existing coastal path along the southern perimeter of the Poolbeg Peninsula.
- b. Development of a sailing, rowing and maritime campus (Maritime Village) adjacent to the existing Poolbeg Yacht and Boat Club in conjunction with local yacht and boating clubs, including a public slipway and facilities for maritime skills training.
- c. Provision of Recreational Space
  - i. Port Park and Wildflower Meadow (2.5ha)
  - ii. Coastal Park (1.6ha)
- d. Provision of 1.1ha extension to Irishtown Nature Park.

Enhanced public realm through:

- e. Development of a new public plaza as a key part of the Maritime Village.
- f. Extensive boundary softening works adjacent to the development sites forming part of the 3FM Project.

Community support through:

- g. Establishment of a new €2 million Community Benefit Fund for Education, Heritage & Maritime Training Skills projects within the Poolbeg area. The initial capital for the Fund will be administered by DPC in consultation with local stakeholders.

Heritage & Biodiversity enhancements through:



- h. Commissioning a new Public Access Feasibility Study regarding the Great South Wall so as to identify improved public interpretation, accessibility, facilities and conservation possibilities,
- i. Provision of up to €1 million funding to implement the study recommendations.
- j. Provision of an additional permanent marine structure (dolphin) to expand the available habitat and range of the Dublin Port Tern Colonies.

A General Arrangement Drawing illustrating the main elements of the 3FM Project is presented in Figure 1 2.

Other significant ancillary works include:

- Improvements to the existing road network, linking and providing access to the port terminals, including new signal-controlled junctions and a new roundabout on Pigeon House Road;
- Improved pedestrian access from Irishtown to the proposed Maritime Village; and
- Demolition of the existing Poolbeg Oil Jetty and Sludge Jetty.

In addition, but outside the scope of the 3FM Project, DPC is making the following provisions:

- Reservation for Utilities – The provision of a 0.5ha site within Dublin Port Masterplan Area O to accommodate the infrastructure required to deliver District Heating from the Dublin Waste to Energy Scheme. The planning consent for this infrastructure will not form part of the 3FM Project and will be a matter for Dublin City Council.
- Renewable Energy Infrastructure - The provision of a 1.5ha site within Dublin Port Masterplan Area M for a substation to facilitate the onshoring and transmission of Offshore Renewable Energy by Codling Wind Park. Planning permission for the development of this infrastructure will be a matter for Codling Wind Park.

## 5 WFD ASSESSMENT

### 5.1 Stage 1: Screening

In line with the Planning Inspectorate guidance, the Project has been screened for WFD Assessment on the basis of the source-pathway-receptor (S-P-R) model.

**Source** – The nature of the works will result in a direct impact on the Liffey Estuary Lower transitional water body, the Dublin Bay coastal water body, the Dodder\_050 and Tolka\_060 river water bodies. The types of activities proposed could potentially have an impact on the environmental objectives of these water bodies.

**Pathway** – As the activities are proposed near or within these waterbodies, there is a direct pathway to the receptor;

**Receptor** – There are a number of the contributing elements of WFD status that could be impacted, particularly the chemical status, the physiochemical and hydro morphological supporting conditions and the biological elements.

Based on the S-P-R model the Project has been **screened in** for WFD Assessment.

### 5.2 Stage 2: Scoping

This section summarises the potential impacts associated with the Project. The potential risks to each of the key receptor groups are considered.

#### 5.2.1 Project design parameters

The project description is provided in Chapter 5 of the EIAR and on the Planning Drawings. Table 5-1 outlines the project design parameters that have been used to inform the assessment of potential impacts of the construction, operational and maintenance and decommissioning phases of the Project on the environmental objectives of the WFD water bodies within the WFD Study Area.

##### 5.2.1.1 Construction phase

Temporary impacts on water quality have the potential to occur during the construction phase of the works. Mobilised suspended sediment and cement release through construction activities are the principal potential sources of water quality impact. The following have been considered in this assessment:

- Habitat disturbance – habitat disturbance has the potential to affect the supporting hydromorphological conditions of water bodies during the construction, operational and maintenance and decommissioning of the Project;
- Increased suspended sediment levels due to the accidental release of sediment to the water column during capital dredging operations, demolition of buildings and structures, the construction of hardstand areas, waterside berths, quay walls, jetties, bridging structures and landside ancillary works to serve the marine operations – suspended sediment has the potential to effect the physico-chemical, biological

and chemical status of water bodies, and also has the potential to impact on the physical features of water bodies due to construction, operational and maintenance and/or decommissioning related activities;

- Accidental release of highly alkaline contaminants from concrete and cement during the demolition of buildings and structures and the construction of hardstand areas, waterside berths, quay walls, jetties, bridging structures, etc.
- Water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals – pollution of water bodies caused by accidental spills/contaminant release has the potential to affect the physico-chemical, biological and chemical status of water bodies during the construction, operational and maintenance and decommissioning of the Project.

### **5.2.1.2 Operational Phase**

The operational phase impacts associated with the 3FM Project (buildings/structures, roads, berths and associated marine berthing and landside works areas) represents an increase in the current normal day to day port activities. These associated impacts are currently well understood and managed within the Port's operational and maintenance procedures. The principal potential sources of water quality impact are:

- Increased suspended sediment levels due to port operations including the ongoing maintenance dredging of the new berths.
- Increased number and size of vessels using Dublin Port.
- General water quality impacts associated with works machinery, infrastructure and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals and releases associated with the operation and maintenance of surface water and foul drainage systems.
- In addition to normal day-to-day port activities and potential impact on water quality, any hydromorphological impacts, associated with the operation of coastal and bankside structures, have been assessed based on the coastal process modelling in Chapter 12 of this EIAR and are assessed further in the context of the designation of the Liffey Estuary Lower as a heavily modified water body (HMWB) with a specified use of Port Operations.

**Table 5-1: Project design parameters used for the assessment of potential impacts for WFD Assessment.**

Potential impact	Project Design Parameters	Justification
<p><b>Construction Phase</b></p> <p>Suspended Sediment and Sedimentation</p>	<p><b><u>Demolition of existing marine structures</u></b> Decommissioning and demolition of existing structures such as the Poolbeg Oil Jetty is required to facilitate the construction of the new Lo-Lo container terminal with cargo handling area, imports terminal (Area N), whilst the Sludge Jetty will be demolished to facilitate the dredging of the proposed ship turning circle in front of Pigeon House Harbour. A small existing concrete nib structure will also be demolished to the east of Berth 45 to facilitate the works in the new Ro-Ro terminal (Area K). A portion of the hardstand at berth 47 will also be removed to facilitate the dredging of the turning circle. Buildings in the existing MTL terminal will be demolished to facilitate the construction of Area K, including a number of portacabin structures and warehousing. Three number buildings in the existing Stella Maris and Poolbeg Rowing/Yacht Club site will also require demolition.</p>	<p>Surface water quality could be impacted during the demolition works outlined above through the generation of sediment plumes during pile removal, or during site clearance by exposing soils/rubble to erosion by rainwater and drainage water run-off from the site.</p>
	<p><b><u>Berth Construction and Re-fronting</u></b> The 3FM Project involves the construction of a new berthage at Area N along the south side of the navigation channel at the eastern extreme of the Port. The works will also include the removal of the Poolbeg Oil Jetty as outlined above. The berth will be used as the new Lo-Lo container terminal. The open piled quay structure will comprise a composite concrete deck slab (precast and in situ concrete elements) which will be supported on steel tubular piles installed in a grid pattern (approximately 6m spacing). The exact spacing of the piles will be subject to detailed design.</p> <p>Re-fronting of the existing caissons along Berth 44 and Berth 45 at Area K will also be undertaken. This will require the installation of a combi wall in front of the existing caissons. A combi-wall comprises tubular steel piles installed at intervals with traditional steel sheet piles filling the space between.</p> <p>Piling is also required at the SPAR road along the southern bank of the Liffey Estuary Lower, at the SPAR Bridge and for the installation of the Linkspan at the Ro-Ro Terminal (Area K).</p>	<p>Pile installation operations have the potential to cause a temporary increase in suspended sediment due to disturbance of the riverbed materials causing the resuspension of sediments in the water column leading to localised reduction in water quality.</p>
	<p><b><u>Capital Dredging and Spoil Disposal</u></b> Dredging is required to facilitate creation of the proposed turning circle, and to provide sufficient water depth at the berthing pocket for the Lo-Lo Terminal at Area N as described in Chapter 5. Dredged depths will range from -8.7m CD to -13m CD.</p>	<p>Dredging operations will cause temporary suspension and release of sediments at the loading sites. Dumping operations will also give rise to temporary sediment plumes at the licensed disposal site at the approaches to Dublin Bay. Dredging loading operations have been</p>

Potential impact	Project Design Parameters	Justification
		<p>designed to minimise the disturbance and escape of material at the seabed and during removal through the water column. Individual loading operations are of relatively short duration and intermittent in nature and the works area is limited. While it is proposed to dispose of most of the dredge spoil at the licensed disposal site which is naturally dispersive for fine sediments, an estimated 70,000m<sup>3</sup> of dredge material from the area of Poolbeg Marina is not suitable for disposal at sea and will require recovery/disposal to a non-hazardous landfill (see Chapter 8). Nevertheless, significant amounts of dredge material will be removed and deposited at the disposal site on the approaches to Dublin Bay over a relatively extended period.</p>
	<p><b>SPAR Road and Bridge</b> There are a number of sections of the SPAR Road that have the potential to generate increased suspended sediment in run-off from the construction areas:</p>	
	<p>The northern section and southern sections of the SPAR road predominantly within Dublin Port Company Lands</p>	<p>Construction works associated with the road construction can give rise to mobilisation and release of sediments during excavation and exposure of unprotected soils and subsoils, stockpiling and the construction of associated infrastructure. This could potentially result in an increase in suspended sediments concentrations in run-off from the site.</p>
	<p>The Spar Bridge across the Liffey Estuary Lower downstream of the Tom Clarke Bridge</p>	<p>As with the berth construction piling and cofferdams will be required for the construction of the bridge piers and abutments. Pile installation operations have the potential to cause a temporary increase in suspended sediment due to disturbance of the riverbed materials causing the resuspension of sediments in the water column leading to the localised reduction in water quality.</p>
	<p>The Spar viaduct with twelve piers (including abutments) along a distance of approximately 600 metres on the south bank of the Estuary linking the SPAR Bridge with the southern SPAR road at the Maritime Village.</p>	<p>As with the SPAR Bridge the piling required for the piers could potentially result in increase in suspended solids</p>
	<p><b>Maritime Village</b> The development of the Maritime Village will require some reconfiguration of the existing modified coastline through the removal of some of the existing reclaimed land in the Lower Liffey Channel and limited areas of new reclamation to facilitate the construction of the Maritime village.</p>	<p>Surface water quality could be impacted during the reconfiguration works through the generation of sediment plumes during the removal of existing reclaimed land and the reclamation of new areas to facilitate the Maritime village.</p>
	<p><b>Landside ancillary works</b> Landside construction works are ancillary works required to serve the marine side works. They consist of construction of ramps and deck structures to access linkspans, services and drainage</p>	<p>Construction works can give rise to mobilisation and release of sediments during excavation and exposure of unprotected soils, stockpiling, and the construction of southern Port Road infrastructure and active travel link.</p>

Potential impact	Project Design Parameters	Justification
	<p>installation, and installation of jetty furniture and fender systems. Other relatively minor boundary and access works are also proposed such as a segregated commuter active travel link which is to be provided connecting the proposed North Wall Square and proposed Liffey-Tolka Project to Sean Moore Park and Sandymount</p>	<p>This could potentially result in an increase in suspended sediment concentrations in run-off from the site.</p>
<p>Concrete and Cement Pollution</p>	<p><b>Demolition of existing buildings &amp; structures</b> Demolition works will be required, and it is likely that this will include localised breaking out of concrete using a rock breaker mounted on an excavator, particularly the removal of the concrete Nib structure at Berth 45 to facilitate the construction of Area K.</p>	<p>This has the potential to create highly alkaline dust in the absence of mitigation, which in turn could find its way into the water column in the Liffey Estuary Lower and pose a threat of pollution. High alkaline contaminants for concrete and cement can have a lethal (direct mortality through toxicity) and sub-lethal (reduced respiration, growth, reproduction) effects on fish, invertebrates, and their habitats</p>
	<p><b>Berth Construction and Re-fronting</b> The impacts in relation to cement and concrete for berth construction (Area N), re-fronting (Area K) and the combi wall at the 47A hardstanding area to facilitate the development of this area by the Codling Wind Park, relate to several elements of work. Concrete will be poured in-situ during construction of jetty concrete decks, bank-seats and access ramps. Precast structures on dolphins and bridge beams will be filled with reinforced concrete. Steel combi-walls will have concrete capping beams and cofferdam voids will be filled with reinforced concrete.</p>	<p>Fresh concrete and cement is highly alkaline and therefore will affect water quality (particularly in terms of pH) if washed into the water body.</p>
	<p><b>SPAR Road and Bridge</b> There will be five piers within the Liffey Estuary Lower which will largely align with piers on the Tom Clarke Bridge so as to minimise impact on navigation and river flows. On the northern shore there will be an abutment and the southern end of the bridge will tie into the proposed SPAR Viaduct which will run parallel with the R131. The SPAR Viaduct will also require a number of supporting piers.</p>	<p>The piers will be constructed within cofferdams with piling required to bed rock level and a concrete pile cap. The piers will then be cast within the cofferdams on top of the pile cap.</p>
	<p><b>Maritime Village</b> The potential impacts in relation to cement and concrete relate to the re-fronting of the shoreline at the Maritime Village and the construction of slipways, boat dock, operational areas for harbour, landside marina areas and public areas.</p>	<p>Concrete will be poured in-situ during construction of these areas and precast structures will be filled with reinforced concrete. Steel combi-walls will have concrete capping beams and cofferdam voids will be filled with reinforced concrete.</p>
	<p><b>Landside ancillary works</b> Landside construction works required to serve the marine side works are described in Chapter 5. The impacts in relation to cement and concrete for the landside works relate to a range of activities mainly including construction and upgrade of access routes, and installation of underground services and drainage systems associated with the road network and active travel path. The works will also include the demolition of a number of buildings within the existing MTL terminal.</p>	<p>Landside works are relatively small scale and are largely separated from aquatic systems by buffer areas. Demolition of concrete structures has the potential to create highly alkaline dust in the absence of mitigation, which could find its way into the aquatic system and pose a threat of pollution. The scale of demolition required is small and some of the structures for removal are prefabricated units.</p>

Potential impact	Project Design Parameters	Justification
General Construction Works	The construction works will involve the use of plant and machinery, as well as the associated temporary storage of construction materials, oils, fuels and chemicals.	During the construction phase there is the potential for accidental spillage or release of construction materials (e.g. diesel, oil, chemicals), and although the potential site compounds will not be sited immediately adjacent to the water body there is the potential for contaminants to drain into the harbour and estuary in the absence of mitigation. It is also possible that residual contaminants may be mobilised during the demolition of the disused Poolbeg Oil Jetty and the reconfiguration of oil pipeline infrastructure with hydrocarbon residuals within the flushed fluids representing possible sources of contamination to the harbour resulting in a localised deterioration in water quality within the port area.
Impact of pile driving on fisheries	The 3FM Project will require extensive pile driving along the 3km linear extent of the works from the new SPAR Bridge downstream to beyond the Poolbeg oil jetty.	The possibility that anthropogenic sound generated by pile driving, in particular impact pile driving, could adversely impact on fish.
Dredge spoil disposal at Burford Bank	It is intended that the spoil generated by the 3FM Project will be disposed of at the Burford site. The Burford Bank disposal sites is 7km east of Poolbeg, in -12m to -24m C.D. of water immediately west of the Burford Bank (Figure 7.2.68). The site has been used since 1996 by Dublin Port to dispose of dredge soil from routine maintenance dredging and occasional capital dredging works e.g., for the ABR Project and MP2 Project.	<p><b>Sub-tidal</b> - The deposition of muds and sandy muds from the port area could result in potential smothering of the native sediment and invertebrates from the existing community below the deposited spoil. Whilst the Burford Bank disposal site is not located within any WFD water body the potential for this activity to impact on the Dublin Bay Coastal Water body is assessed.</p> <p><b>Fisheries</b> - A reduction in the biomass of benthic infauna (worms, bivalves, crustacean etc), as well as mobile epibenthos e.g., shrimps and crabs as a result of the dredge spoil disposal would be expected to temporarily reduce the available food for fish in the area.</p> <p>Fish living on or very close to the bottom, e.g., small dab, plaice, dragonet, lesser weever fish and gobies etc., immediately beneath the dredger hopper during a disposal event may be buried, killed or injured by the descending bulk spoil, whereas others within the water column in and adjacent to the plume are likely to avoid the area. Such effects are expected to be largely localised to the dump site area</p>
<b>Operational Phase</b>		
Suspended Sediment and Sedimentation	The new facilities will increase the number of larger vessels that use Dublin Port. Dredging is required to maintain the established charted depth of navigation channels, manoeuvring areas (including the turning circle), and the operational depths of the berthing pockets at Area K and Area N.	The annual sediment load entering the port from the upstream Liffey catchment, leading to deposition in the port, will not change significantly due to the 3FM Project. Therefore, maintenance dredging requirements to maintain the new channels and pockets should not differ substantially from the current operational conditions. Any increase in suspended sediments and sedimentation due to maintenance dredging as a result of the 3FM Project is likely to be low and is assessed to have a localised minor adverse impact to water quality.

Potential impact	Project Design Parameters	Justification
Washwater from Exhaust Gas Cleaning System	In order to reduce atmospheric pollution, the International Maritime Organisation (IMO) regulates emissions of sulphur oxides (SOx) from ships in line with The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI. It sets limits for the sulphur content of fuels but also allows ships to use alternative compliance options to achieve SOx emission limits in the exhaust gas. One of the main alternative compliance options is an Exhaust Gas Cleaning System (EGCS). Wet and dry EGCS systems are available.	<p>The new facilities will allow increase the number of larger vessels to that use Dublin Port. The main pollutants of concern from EGCS emissions in relation to environmental impact and human health risk are acidification (decreased pH), PAHs, metals and particulate matter (PM). In recent years Dublin Port Company, through very significant investment, has made great progress in improving the aquatic environment of the Port, both water and sediment quality.</p> <p>Given the sensitivity of the receiving environment in the jurisdictional area of Dublin Port Company, the clear evidence for pollutant discharges from EGCS, and the significant information and data gaps in relation to ambient environmental impacts and cumulative effects, Dublin Port applies the precautionary principle and currently has an active Marine Notice prohibiting EGCS discharges. The increase in larger vessels will therefore not result in increased loading of contaminants of concern. This will continue until more evidence on the impact of the washwater from EGCS is known.</p>
General Operational Activities	<p><b>Surface Water Drains</b> Surface water drains installed in new hardstand areas, the SPAR road, and the reconfigured road network on the Poolbeg Peninsula have the potential to provide pathways for a wide range of contaminants arising from general port operations to the aquatic environment. Direct pathways also exist within the immediate landside hinterland of facilities.</p> <p><b>Foul Water</b> The development will be serviced by a dedicated foul water network connecting to the existing Uisce Éireann Rathmines to Pembroke 1,500mm trunk sewer, which will also require a diversion to accommodate the development of Area K Ro-Ro terminal.</p>	<p>Such pollutants may derive from spillages, vehicle operation, atmospheric deposition, erosional losses and leakages. The main potential pollutants from surface water drainage or direct run-off are sediment, hydrocarbons, and trace contaminants including metals and organics.</p> <p>The increased loading to the urban wastewater agglomeration at Ringsend will be relatively small when compared to the overall loading to the Ringsend WWTP and will no.</p>
Changes in the hydromorphological supporting conditions through habitat alterations impacting on ecological status	The designation of the Lower Liffey as a Heavily modified water body means that a realistic objective (good ecological potential) is set that acknowledges that the water body has been physically altered for a specified use that society needs to be continued. The physical modifications caused by the use need to be mitigated against as far as possible, whilst acknowledging that the specified use needs to be retained.	The algal, fish and benthic invertebrate communities (biological elements of Ecological status) have the potential to be affected by hydromorphological alterations associated with the 3FM Project.
	<b>SPAR Bridge</b> The bridge will be placed on 5 stanchions, with a further six concrete dolphins placed adjacent to the bridge.	<b>Sub-tidal</b> - The footprint of these stanchions and dolphins will directly impact the sub-tidal benthos.



Potential impact	Project Design Parameters	Justification
	<p><b>SPAR Road</b> The SPAR road is designed as a bridge structure with 13 sets of five piles and four sets of ten piles. This will result in the placement of 105 piles into the soft sediment adjacent to the existing road.</p>	<p><b>Sub-tidal</b> -The piles will directly impact the soft sediment sub tidal benthos due to habitat loss within their direct footprint.</p> <p><b>Inter-tidal</b> - The shading effects of the SPAR road could impact on the inter-tidal benthos along the revetment on the south bank of the Liffey Estuary Lower. The shading will result in the complete dieback of the heavy algal cover on the revetment, which will be also result in the absence of any associated invertebrates, particularly Littorinid molluscs. It may also reduce the attractiveness of parts of the mid to lower shore for juvenile green crab (<i>Carcinus maenas</i>) and mobile epibenthos such as amphipods which are currently very common under the algal cover during low tide. If juvenile mullet, bass or butter fish and other estuarine fish feed here during flooding and ebbing tides, this resource will probably be diminished as a result of this change.</p> <p><b>Fisheries</b> - If juvenile mullet, bass or butter fish and other estuarine fish feed here during flooding and ebbing tides, this resource will probably be diminished as a result of this change.</p> <p>Clearly, all these same algae and invertebrates are present abundantly on similar revetments, mainly downstream of this point, so while there will be a localised drop in diversity it will not result in the elimination or even significant loss of any particular species, neither will it prevent fish from feeding immediately sub tidally or downstream in similar habitats.</p>
	<p><b>Maritime Village</b> This will require the reconfiguration of the Poolbeg Marina with new Finger Berths and a bunkering facility. The proposed development will result in the creation of 258 finger and mooring boom berths in the Liffey Estuary Lower.</p>	<p><b>Sub tidal</b> - This will require the placement of 100 number steel tubular marina restraints, 0.7m in diameter. In addition, it will require the dredging of sediment from the area of the new marina to a depth of -3.0m C.D. This will result in the dredging of 195,000m<sup>3</sup> (including an allowance for dredging tolerance) of muds and sandy muds. The placement of 3,879m<sup>2</sup> of rock armour scour protection below the MLWS mark running parallel to the SPAR Road will result in the replacement of this area of soft sediment habitat with hard benthos.</p> <p><b>Inter-tidal</b> - Overall, the new marina will add to the diversity both of habitat and species in this section of the River Liffey due to the provision of additional hard surface areas on pontoon floats and piles.</p> <p><b>Fisheries</b> - In the context of the Liffey, it is possible that juvenile mullet and perhaps juvenile bass might use the marina both for food (plant and animal) and as a means of avoiding predation by both birds and larger fish which would be a positive impact. It would seem unlikely that bottom dwelling species, such as flounder, butterfish or eel would forage among the pontoons although they might feed at the base of any of the piles associated with the new marina.</p>

Potential impact	Project Design Parameters	Justification
	<p><b>Turning Circle</b> The proposed 325m diameter turning circle will see the removal of approximately 145m of rip-rap revetment and its replacement with a vertical steel combi-wall. The seabed will be dredged to a depth of -10m CD within the footprint of the circle. It will also require the removal of the existing sludge jetty.</p>	<p><b>Sub-tidal</b> - The area to be dredged consists of muds and sandy muds with pockets of bare gravel in areas where shipping activity causes scouring of the seabed. The faunal communities present in the muddy and sandy mud areas consist of highly opportunistic fauna, well adapted to episodic disturbance events. The demolition of the existing sludge jetty will allow for the creation of a small amount of new soft-sediment benthic habitat in the footprint of the existing jetty, resulting in a slight positive and permanent impact</p> <p><b>Inter-tidal</b> - This will result in the loss of all the intertidal algae and diverse range of typical intertidal hard benthos invertebrates including barnacles, limpets, a range of gastropod snails and mobile crustaceans, including amphipods and juvenile green crab</p>
	<p><b>New RoRo terminal near Berth 44 (Area K)</b> Local dredging will be required to allow for local deepening to place scour protection at the base of the replacement quay at Berth 45.</p>	<p><b>Sub-tidal</b> - This will result in the dredging of circa 7,500 m<sup>3</sup> of muds and sandy muds.</p> <p><b>Inter-tidal</b> - This entails adding a steel piled combi-wall to the existing berth along 225m of berth and adding 3,658m<sup>2</sup> of subtidal scour protection. The latter will add to the local habitat diversity, however, the movement of shipping at the berth will reduce its value as a habitat. Overall, these changes will have a negligible to neutral impact on intertidal ecology.</p>
	<p><b>New LoLo terminal (Area N)</b> The proposed development at Area N will require the existing Poolbeg Oil Jetty to be demolished and the creation of a new wharf as a fully open piled structure which will require the placement of circa 2,500 circa 1.3m diameter steel pile structures over approximately 9.1ha. of soft sediment benthic habitat.</p>	<p><b>Sub-tidal</b> - This will result in the loss of circa 3,300m<sup>2</sup> of habitat in the footprint of the proposed piles. In addition, a berthing pocket for container vessels is proposed adjacent to the wharf, with the area dredged to a depth of -13.0m C.D. This will result in the dredging of 533,000 m<sup>3</sup> from the berthing pocket and 72,000 m<sup>3</sup> from the pocket for marine construction, leading to a total of 605,000m<sup>3</sup> from Area N.</p> <p><b>Inter-tidal</b> - The main impact of the wharf at Area N will be the shade it casts. This will impact the intertidal algae adhering to the GSW itself and the two sections of rock armour intertidal adjoining the eastern sides of the two ESB Intake structures along this stretch of shore.</p> <p><b>Fisheries</b> - The area which will lie beneath Area N is very productive of infauna due to the constant particulate organic inputs from the nearby WWTP, so it constitutes an important food source for both fish and other epibenthic predators such as crabs and brown shrimp</p>

## 5.2.2 Scoping summary

The scoping assessment has been applied for the proposed works identified in chapter 5: Project Description. The potential impacts for each activity have informed the selection of the activities which are scoped into the assessment.

It is necessary to identify links between the Project and every WFD Status quality element that could be affected. For all activities, the scoping phase involves considering each WFD quality element to identify where a possible causal link between the quality element and the activity exists. That is, where water body status or objectives could be affected at water body level by the proposed activities. Table 5-2 provides a summary of the scoping assessment undertaken for the Project.

**Table 5-2: Potential impacts associated with the Project and outcome of scoping assessment for the WFD compliance assessment for onshore surface water bodies in the WFD study area.**

Potential impact	Biological supporting elements			Hydromorphological supporting elements		Physio-chemical supporting elements	Chemical	
	Fish	Invertebrates	Macrophytes	Hydrological regime	Morphology		Priority hazardous substances	Priority substances
<b>Construction Phase</b>								
Suspended Sediment and Sedimentation	<b>Scoped in (see Table 5-1)</b> Suspended sediment and sedimentation can impact on substrate and biological elements that rely on this habitat. Suspended solids in the water column can also have an impact on mobile species, particularly fish. Overall, the resident estuarine and marine migrant fish population will experience some degree of sub-lethal stress and temporary and localised community disruption associated with elevated turbidity levels during the dredging process.			<b>Scoped in (see Table 5-1)</b> Sedimentation can impact on the morphology of the channel impacting on the supporting hydromorphological conditions.		<b>Scoped in (see Table 5-1)</b> Suspended sediment and sedimentation can impact on the oxygenation conditions, nutrients and temperature of a water body	<b>Scoped in (see Table 5-1)</b> There is the potential for contaminants bound to suspended solids to drain into the harbour and estuary.	
Accidental release of highly alkaline contaminants from concrete and cement	<b>Scoped in (see Table 5-1),</b> High alkaline contaminants for concrete and cement can have a lethal (direct mortality through toxicity) and sub-lethal (reduced respiration, growth, reproduction) effects on fish, invertebrates, and their habitats			<b>Scoped out</b> There will not be any impact on the physical attributes of the water bodies		<b>Scoped in</b> Fresh concrete and cement is highly alkaline and therefore will affect water quality (particularly in terms of pH) if washed into the water body	<b>Scoped Out</b> There is no significant potential for priority or priority hazardous substances from the release of alkaline contaminants.	
The impact of pollution caused by accidental spills/contaminant from General Construction Activities	<b>Scoped in (see Table 5-1)</b> During the construction phase there is the potential for accidental spillage or release of construction materials (e.g. diesel, oil, chemicals), It is also possible that residual contaminants may be mobilised during the demolition of the disused Poolbeg Oil Jetty resulting in a localised deterioration in water quality within the port area.			<b>Scoped out</b> There will not be any impact on the physical attributes of the water bodies		<b>Scoped in (see Table 5-1)</b> As per Biological elements	<b>Scoped in (see Table 5-1)</b> During the construction phase there is the potential for accidental spillage or release of construction materials (e.g. diesel, oil, chemicals), It is also possible that residual contaminants may be mobilised during the demolition of the disused Poolbeg Oil Jetty resulting in a localised deterioration in water quality within the port area.	
Impact of pile driving on fisheries	<b>Scoped in (see Table 5-1)</b> The possibility that anthropogenic sound generated by pile driving, in particular impact pile driving, could adversely impact on fish, particularly in the Lower Liffey Estuary transitional water body.			<b>Scoped out</b> The pile driving will not impact on the supporting hydromorphology of the water bodies affected. The impact of the structures on supporting hydromorphological conditions is assessed under the operational phase		<b>Scoped out</b> This activity during construction will not impact on the supporting physico-chemical conditions of the Liffey Estuary Lower, Dublin Bay or any of the other water bodies within the study area	<b>Scoped out</b> This activity during construction will not impact on the chemical status of the Liffey Estuary Lower, Dublin Bay or any of the other water bodies within the study area.	
Dredge spoil disposal at Burford Bank	<b>Scoped in (see Table 5-1)</b> The deposition of muds and sandy muds from the port area could result in potential smothering of the native sediment and invertebrates from the existing community below the deposited spoil. The reduction in biomass could also impact on fish feeding in this area.  Fish living on or very close to the bottom, e.g., small dab, plaice, dragonet, lesser weever fish and gobies etc., immediately beneath the dredger hopper during a disposal event may be buried, killed or injured by the descending bulk spoil.			<b>Scoped out</b> As outlined in Chapter 13 the movement of coarse material into Dublin Bay as a result of disposing of dredge material at the dump site is extremely limited and highly unlikely to result in a large-scale deposition event in Dublin Bay that would impact on the supporting hydromorphological supporting conditions. This disposal option at the Burford bank also keeps the sand element of the dredge material within the natural Dublin Bay sediment cell.		<b>Scoped in (see Table 5-1)</b> A programme of sediment quality sampling and analysis within the Tolka Estuary and Dublin Port area (Chapter 8) has shown that that the sediments to be dredged as part of the 3FM Project are suitable for conventional dumping at sea (subject to the granting of a Dumping at Sea Permit by the EPA) with the exception of an estimated 70,000m <sup>3</sup> of dredge material from the area of Poolbeg Marina is not suitable for disposal at sea and will require recovery/disposal to a non-hazardous landfill.		
<b>Operational Phase</b>								
Suspended Sediment and Sedimentation	<b>Scoped Out</b> The annual sediment load entering the port from the upstream Liffey catchment, leading to deposition in the port, will not change significantly due to the 3FM Project. Therefore, maintenance dredging requirements to maintain the new channels and pockets should not differ substantially from the current operational conditions. Any increase in suspended sediments and sedimentation due to maintenance dredging as a result of the 3FM Project is likely to be low and is assessed to have a localised minor adverse impact to water quality.			<b>Scoped Out</b> The current maintenance dredging regime will not change substantially and therefore there will be no further impact on hydromorphological supporting condition, physico-chemical supporting conditions and the chemical status of the Liffey Estuary Lower from the 3FM Project from Dublin Port maintenance dredging.  Maintenance dredging is an ongoing requirement in the port and new licences will be required to cover maintenance of the areas newly dredged in capital dredging works under the 3FM Project. Maintenance dredging will implement the comprehensive mitigation measures which are part of every maintenance dredging campaign as detailed in Section 9.5.2 of the EIAR				

Potential impact	Biological supporting elements			Hydromorphological supporting elements		Physio-chemical supporting elements	Chemical	
	Fish	Invertebrates	Macrophytes	Hydrological regime	Morphology		Priority hazardous substances	Priority substances
	Maintenance dredging is an ongoing requirement in the port and new licences will be required to cover maintenance of the areas newly dredged in capital dredging works under the 3FM Project. Maintenance dredging will implement the comprehensive mitigation measures which are part of every maintenance dredging campaign as detailed in Section 9.5.2 of the EIAR							
Washwater from Exhaust Gas Cleaning System	<b>Scoped out</b> DPC will continue to enforce the existing Marine Notice (Notice to Mariners (No 26 of 2021) – Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water) prohibiting the discharge of EGCS effluent from existing and new vessels resulting from the 3FM Project into Dublin Port jurisdictional waters until such time as EGCS may be conclusively proven not to impact water or sediment quality. This will ensure that new and larger vessels using the port as a result of the greater capacity offered by the 3FM Project will not have the potential to impact on the water quality of the Lower Liffey Estuary, Dublin Bay or the Tolka Estuary.  In circumstances where the above existing measure is continued to be employed, the potential impact to receiving water environment will be reduced to negligible thus ensuring the different elements contributing to the ecological and chemical status of the Liffey Estuary Lower and Dublin Bay will not deteriorate.							
General Operational Activities	<b>Scoped in (see Table 5-1)</b> Surface water drains installed in new hardstand areas, the SPAR road, and the reconfigured road network on the Poolbeg Peninsula have the potential to provide pathways for a wide range of contaminants arising from general port operations to the aquatic environment which could impact on the supporting biological elements.			<b>Scoped out</b> The surface water drainage system will have outfalls which discharge to the Liffey Estuary Lower at the shoreline, however the construction of these new outfalls will occur on an already modified section of the coastline and will not introduce new hydromorphological pressures.		<b>Scoped in (see Table 5-1)</b> Surface water drains installed in new hardstand areas, the SPAR road, and the reconfigured road network on the Poolbeg Peninsula have the potential to provide pathways for a wide range of contaminants arising from general port operations to the aquatic environment and the physicochemical supporting conditions and chemical status.		
Changes in the hydromorphological supporting conditions through habitat alterations impacting on ecological status	<b>Scoped in (see Table 5-1)</b> The Liffey Estuary Lower is a designated HMWB however there is still a requirement to achieve good ecological potential which, as outlined in section 3.3.2, requires the biological elements which are not sensitive to hydromorphological impacts to achieve good status and those that are sensitive must achieve at least the best condition since the modifications were put in place (which in the case of the Liffey Estuary Lower is good ecological status).			<b>Scoped in (see Table 5-1)</b> Even though the Liffey Estuary Lower is a heavily modified water body it still needs to achieve good ecological potential and based on the approach that Ireland is adopting as outlined in section 3.3, measures to mitigate the impacts from hydromorphology should be considered in these water bodies, including the potential impacts on coastal process and how these could impact on the supporting hydromorphology conditions.		<b>Scoped in (see Table 5-1)</b> Changes in hydromorphology can impact on the physico-chemical supporting conditions of a water body including the temperature and dissolved oxygen levels		<b>Scoped out</b> Changes in the hydromorphological supporting conditions through habitat alterations should not impact on the chemical status of the water body.

## 5.3 Stage 3: Impact Assessment

Based on the outcomes of the Stage 2 scoping assessment, this impact assessment establishes whether the activities associated with the proposed works will:

1. Cause deterioration in water body status; and/or
2. Impinge upon protected areas designated under the European Directives listed in Article 5 of the WFD.
3. Prevent the achievement of WFD status objectives;

This is the stage of the assessment where evidence is provided to demonstrate that the proposed works are compliant. Specifically, for each quality element it must be shown that the activities scoped into the assessment will not cause a deterioration in status of any of the contributing quality elements nor prevent the achievement of WFD status objectives. Where appropriate, it is also the stage where design mitigation, aimed at reducing the effect of an activity, is discussed. The assessment looks at each individual water body that could potentially be affected by the proposed development in the context of its status, the main contributing elements to the status classification, the objective of the water body and scoped in activities.

### 5.3.1 Measures included in the Project

For the purposes of the WFD Assessment process, the term 'measures included in the project' is used to include the following measures (adapted from IEMA, 2016):

- Measures included as part of the project design. These include modifications to the location or design of the Project which are integrated into the application for consent. These measures are secured through the consent itself through the description of the development and the parameters secured in the consent and/or marine licences (referred to as primary mitigation in IEMA, 2016)
- Measures required to meet legislative requirements, or actions that are generally standard practice used to manage commonly occurring environmental effects and are secured through the planning condition requirements and/or the conditions of the marine licences (referred to as tertiary mitigation in IEMA, 2016).

#### 5.3.1.1 Measures included as part of the project design

As part of the project design process, a number of measures have been proposed to reduce the potential for impacts on the environmental objectives of the water bodies within the WFD Study area particularly the hydromorphological impacts associated with the potential physical changes to the Liffey Estuary Lower as a result of the new structures and dredging proposed as part of the 3FM Project. These measures include designed-in and management measures (controls). Table 5-3 outlines the groups of measures that are included in the EU tool box of measures, discussed in Section 3.3.3, examples of best practice specific measures that will contribute to the achievement of good ecological potential in HMWBs and the mitigation measures proposed as part of the 3FM Project under each measure category.

**Table 5-3: Measures included in the Project**

Key groups of measures from EU tool box	Examples of Specific measures to reach GEP	Mitigation incorporated into 3FM Design
Realign to mitigate effects on flow	<ul style="list-style-type: none"> <li>- Construct structures to normalise flow; realign breakwater, frontage, etc.</li> <li>- Lower or sever root of groyne or breakwater</li> <li>- Reduce wave reflection; increase wave absorption</li> <li>- Build culverts in breakwaters, groynes, etc.</li> <li>- Introduce e-flow</li> </ul>	<ul style="list-style-type: none"> <li>- Lo-Lo container terminal (Area N) is an open piled structure</li> <li>- SPAR Viaduct – open piled structure</li> <li>- SPAR Bridge – aligns with Tom Clarke Bridge piers to ensure flow regime is not significantly impacted</li> </ul>
Sediment management	<ul style="list-style-type: none"> <li>- Sediment bypassing, move sediment from behind breakwater, dam, jetty, terminal groyne, etc. and (re)place in natural system to address downstream/downdrift erosion (habitat loss or degradation)</li> <li>- Sever root of groyne, breakwater, etc. to reinstate longshore sediment transport</li> </ul>	<ul style="list-style-type: none"> <li>- Lo-Lo container terminal (Area N) is an open piled structure</li> <li>- SPAR Viaduct – open piled structure</li> <li>- SPAR Bridge – aligns with Tom Clarke Bridge piers to ensure flow regime is not significantly impacted</li> </ul>
Modification or management of operations or structures e.g. sluices, vessel traffic	<ul style="list-style-type: none"> <li>- Remove redundant infrastructure</li> <li>- Modify operation of lock, sluice or other structure to facilitate fish passage or to maintain desired salinity levels</li> <li>- Retrofit if necessary to enable above</li> <li>- Use fluid mud navigation / dynamic underkeel clearance where safe to do so</li> <li>- Explore use of SMART technology for vessel traffic management</li> <li>- Speed limits to reduce wash-induced erosion</li> </ul>	<ul style="list-style-type: none"> <li>- Removal of oil jetty</li> <li>- Removal of sludge jetty</li> <li>- Removal of concrete Nib at Berth 47</li> <li>- New Structures will not have negative impact on fish passage</li> <li>- Open piled structure at Lo-Lo container terminal (Area N), SPAR viaduct</li> <li>- Use of SMART Technology for vessel traffic management at turning circle</li> <li>- Speed limits to be imposed to reduce wash-induced erosion</li> <li>- Continued Enforcement of the Marine Notice (Notice to Mariners (No 26 of 2021) – Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water) prohibiting the discharge of EGCS effluent from existing and new vessels.</li> </ul>
Intertidal habitat restoration, enhancement or creation	<ul style="list-style-type: none"> <li>- Habitat rehabilitation</li> <li>- Managed realignment to new line</li> <li>- Re-open polders; setback (to higher ground; to existing secondary defence line)</li> <li>- Step back (create intertidal shelf against vertical wall)</li> <li>- Planter baskets; other planting initiatives</li> <li>- Improve creek or backwater habitats</li> <li>- Use breakwaters, shore parallel islands or similar to create sheltered conditions promoting intertidal enhancement</li> <li>- Offsetting measures e.g. spawning habitat for fish</li> </ul>	<ul style="list-style-type: none"> <li>- Significant area of new hard surfaces represented by the open piled structures which are likely in the main to be rapidly colonised by both estuarine and marine flora and fauna</li> <li>- Habitat enhancement measures being trialled using eco-structures</li> </ul>
Seasonal or tidal constraints on activity	<ul style="list-style-type: none"> <li>- Constraints on maintenance activities or other works during breeding/spawning season or fish migration periods; low oxygen</li> <li>- Working on flood or ebb tide to avoid impacts on sensitive adjacent habitats or species</li> <li>- Programme vegetation cutting or clearance</li> </ul>	<ul style="list-style-type: none"> <li>- Dredging in Dublin Port is seasonally constrained so as to avoid impacting on sensitive species and habitats;</li> <li>- Non-piling windows are presented in Table 5 4</li> </ul>
Selection of methods or equipment	<ul style="list-style-type: none"> <li>- Select dredging method to retain sediment in system or to avoid raising suspended sediment levels</li> <li>- Use silt curtain</li> <li>- Manage overspill</li> <li>- Selective cutting or clearance e.g. only along one bank</li> <li>- Use long arm excavator to avoid disturbing or damaging sensitive habitats; to retain riparian vegetation</li> <li>- Strip dredging (for aggregate) to facilitate recolonisation</li> </ul>	<ul style="list-style-type: none"> <li>- Dredging will be undertaken using methods to minimise suspended sediment levels (see best practice measures below)</li> <li>- Management of overspill</li> </ul>

As there is a commitment to implementing these measures, they are considered inherently part of the design of the Project and have therefore been considered in the WFD Assessment (i.e. the determination of potential impact on a water body's objective, including protected area objectives, assumes implementation of these measures).

### **5.3.1.2 Measures required to meet legislative requirements, or actions that are generally standard practice**

#### **5.3.1.2.1 Construction Phase**

##### **Best Practice Measures**

Mitigation measures will be implemented by the contractor and will include the requirements for best practice and adherence to the following relevant Irish guidelines and recognised international guidelines:

- Good practice guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, 2001);
- Netregs Guidance for Pollution Prevention series (GPP) in relation to a variety of activities developed by the Scottish Environmental Protection Agency (SEPA), Natural Resources Wales (NRW) and the Northern Ireland Environment Agency (NIEA);
  - GPP2: Above Ground oil storage tanks
  - GPP3: Use and design of oil separators in surface water drainage
  - GPP5: Works and maintenance in or near water
  - GPP6: Working at construction and demolition sites
  - GPP8: Safe Storage and disposal of used oils
  - GPP13: Vehicle washing and cleaning
  - GPP20: Dewatering underground ducts and chambers
  - GPP21: Pollution incident response planning
  - GPP22: Dealing with spills
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016);
- International Convention for the Prevention of Pollution From Ships, 1973, as modified by the Protocol of 1978 (MARPOL) for domestic waste discharges to the environment;
- International Marine Organisation guidelines; and
- Control of Substances Hazardous to Health (COSHH) Handling of Hazardous Materials.



## Suspended Sediment and Sedimentation

Suspended sediment, including all soils, sands and rubble, is the single main pollutant to the aquatic environment generated at construction sites and largely arises from the erosion of exposed soils and sediments by surface water runoff. The adoption of appropriate erosion and sediment controls during construction is essential to prevent sediment pollution.

### Demolition of existing buildings and structures, berth construction and construction of landside ancillary works

As indicated in Table 5-1 demolition and construction works have the potential to result in a localised impact on water quality.

The mitigation and control measures to address the impact from suspended sediments associated with these activities will follow sound design principals and good working practices as listed in the Netregs Guidance for Pollution Prevention series. In addition to the requirements of best practice and relevant guidelines, the following mitigation measures will be implemented by the contractor during the construction phase.

- Where preferential surface flow paths occur, silt fencing or other suitable barriers will be used to ensure silt laden or contaminated surface runoff from the site does not discharge directly to a water body or surface water drain.
- In the event that dewatering of foundations or drainage trenches is required during construction and/or discharge of surface water from sumps, a treatment system prior to the discharge will be used; silt traps, settlement skips etc. This measure will allow additional settlement of any suspended solids within storm water arising from the construction areas.

Assuming the above mitigation measures are employed during demolition, clearing, road and berth construction activities, the potential impact to receiving water environment will be reduced to negligible thus reducing the significance of environmental effect to *Imperceptible*.

## Capital Dredging and Spoil Disposal

The Dublin Port Company completed a winter capital dredging season in October 2022 as part of the MP2 Project. This dredging campaign was fully compliant with the requirements of all the development consents, as confirmed by high resolution environmental monitoring results reported in the Annual Environmental Report submitted to the Office of Environmental Enforcement (OEE) in March 2023. Further capital dredging for the MP2 Project was completed in March 2024. The monitoring included year-round real-time measurement of water quality parameters in the Liffey Estuary at four monitoring stations chosen to represent ambient surface water quality in the Liffey Estuary Lower and in the Tolka Estuary water bodies. This was supplemented by sediment plume and hydrographic monitoring that validated Plume Dispersal Modelling, as reported in the Year 7 Environmental Monitoring Report for the ABR and MP2 Projects (RPS, 2023).

A Dredging Management Plan was developed for the MP2 Project and is set out in the *MP2 Project Construction Environmental Management Plan (CEMP) Rev A, November 2021*. The mitigation for dredging

operations in the 3FM Project has been informed by the MP2 Project and the ABR Project monitoring and experience working in the same locations. The following key relevant mitigation measures will apply to each dredging campaign in the 3FM Project:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- The capital dredging activity will be carried out during the winter months (October – March) to negate any potential impact on salmonid migration (particularly smolts) and summer bird feeding, notably terns, in the vicinity of the dredging operations.
- No over-spilling from the vessel will be permitted while the dredging activity is being carried out within the inner Liffey Channel.
- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site. This is equivalent to a maximum quantity per trip of 2,030 tonnes (wet weight).
- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS 2014).
- A documented Accident Prevention Procedure will be put in place prior to commencement.
- A documented Emergency Response Procedure will be put in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.
- When any dredging is scheduled to take place within a 500m radius of power station intakes, the relevant stakeholders will be notified so that precautionary measures can be taken if deemed necessary.

In circumstances where the above mitigation measures are employed during capital dredging and disposal operations, the potential impact to receiving water environment will be negligible thus reducing the significance of environmental effect to *Imperceptible*.

## Concrete and Cement Pollution

### Demolition of existing buildings and structures, berth construction and re-fronting, maritime village construction and construction of landside ancillary works

The impacts in relation to cement and concrete for the 3FM Project are, for the most part (but not limited to); demolition of buildings and structures, construction of piles and foundations for the berthing areas, quay walls etc., the installation of the concrete berthing area areas (to be poured in-situ) and construction of landside ancillary works.

The principal risks and related mitigation measures are:

- Breaking of concrete (associated with structure demolition) has the potential to emit alkaline dust into the receiving environment. A barrier between the dust source and the sensitive receptor (the water body in this case) will be erected to limit the possibility of dust and falling debris from contacting the receptor.
- Concrete use and production shall adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water. Any on-site concrete production will have the following mitigation measures: bunded designated concrete washout area; closed circuit wheel wash and initial siting of any concrete mixing facilities such that there is no production within a minimum of 10 metres from the aquatic zone.
- The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, from the shuttered structures and cofferdams that will be used to contain the concrete.
- Where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher than normal fines content, a higher cement content or the use of chemical admixtures.

In circumstances where the above mitigation measures are employed during demolition, clearing and berth construction operations, the potential impact to receiving water environment will be reduced to negligible thus reducing the significance of environmental effect will be reduced to *Imperceptible*.

## General Construction Works

The risk of water quality impacts associated with works machinery, infrastructure and on-land operations (for example leakages/spillages of fuels, oils, other chemicals and waste water) will be controlled through good site management and the adherence to codes and practices which limit the risk to within acceptable levels.

The following measures will be implemented during construction:

- A detailed works specific Construction Environmental Management Plan (CEMP) will be prepared by the contractor which will meet the minimum requirements of the draft CEMP (under separate cover) and will

include detail in respect of every aspect of the works in order to minimise potential impacts and maximise potential benefits associated with the works;

- Management and auditing procedures, including tool box talks to personnel, will be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions;
- Existing and proposed surface water drainage and discharge points will be mapped on the Drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants;
- The use of oils and chemicals on-site requires significant care and attention. The following procedures will be followed to reduce the potential risk from oils and chemicals:
  - Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. The control measures in GPP2: Above Ground Oil Storage Tanks and GPP 26 “Safe storage – drums and intermediate bulk containers” will be implemented to ensure safe storage of oils and chemical.
  - The safe operation of refuelling activities shall be in accordance with GPP 7 “Safe Storage – The safe operation of refuelling facilities”.
- Contingency Planning: A project specific Pollution Incident Response Plan will be prepared by the contractor consistent with DPC's Environmental Emergency Plan and will be in accordance with GPP 21 Pollution Incident Response Planning. Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures are implemented, the finalisation of the draft CEMP is considered to be best practice. The contractor's Environmental Manager and DPC will be notified in a timely manner of all incidents where there has been a breach in agreed environmental management procedures. Suitable training will be provided by the contractor to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions is taken.

In circumstances where the above mitigation measures are employed during construction the significance of environmental effect to the receiving water environment will be reduced to *Imperceptible*.

## **Piling**

Mitigation for impact pile driving comprises two main approaches, mechanical mitigation and non-piling windows. Mechanical mitigation involves the use of methods to intercept the sound emanating from the pile and thereby reduce its power, while non-piling windows are designed to allow particularly threatened species to pass through the area of the piling operation without exposure to potentially detrimental sound levels.

### Mechanical Methods

Mechanical methods include measures such as cofferdams, which are designed to interrupt and reduce the sound energy transmitted by piling driving by creating a gap (usually air filled) between the active pile and

the medium (water). In the case of a cofferdam this entails erecting a sheet pile enclosure around the active pile, dewatering the intervening gap, thereby effectively pile driving in air rather than water, resulting in a reduction in the level of transmitted sound. (see Molnar *et al.*, 2020).

The main drawback with mechanical mitigation measures is that they slow the progress of a project, depending on the extent of mitigation required, thereby adding to the project cost.

### Non-Piling Windows

An example of the use of a non-piling window is the fact that during the ABR Project piling did not take place along the riverside channel (i.e., outside of the basins), during the months of March, April and May which would have allowed most of the Liffey's salmon smolts to migrate without exposure to piling sound.

### Recommendations

Recommended non-piling windows are presented in Table 5-4. In order to protect out-migrating salmon smolts, the same non-piling window used for the ABR Project is being recommended again for all impact pile driving, i.e., no piling from March-May inclusive for the upper river piling sites. However, vibratory piling which has been shown not to adversely impact fish or to only do so within a few metres of an active pile should be permitted at any time of year. This in effect means that both the SPAR Viaduct tubular piles and Area K sheet piles, both of which will be driven using vibratory piling only, can proceed at any time of the year. If at some stage it is found necessary to use impact piling on these structures, e.g., where vibratory piling proves ineffective to fully secure the piles, then that portion of the piling must be undertaken outside the March-May window also. This non-piling window will also serve to protect some of the very small number of larger multi-sea-winter (MSW) adult salmon which may enter the Liffey early in the year.

The position of the SPAR bridge piers in the narrowest section of the river means that these should not be driven, by impact piling, except in the months October to the end of February, although preparatory works and post impact piling works could take place at any time. This mitigation is designed to avoid the bulk of the smolt run and the peak grilse inward migration. Because of the large size of the Ro-Ro ramp at Area K (i.e., 2.4m diameter), in a fairly narrow portion of the channel, it is recommended that these piles should also be driven only from October to the end of February or if cofferdams are used, piling might also be undertaken in June.

At Area N, the outer six rows of piles, including the two rows of larger diameter piles for the crane tracks, (1.626m) it is recommended that these should not be driven in either July or August, the months during which, on average, the highest numbers of returning adult salmon run. For the remaining, inner rows of Area N piles, all of them of the smaller diameter (1.219m), no restriction on the timing of piling is recommended.

For items with few piles like the SPAR Bridge and the Ro-Ro ramp at Area K, if it is not feasible for whatever reason to adopt the recommended non-piling windows, then consideration must be given to using mechanical mitigation measures i.e. cofferdams. In any case, the March-May non-piling window must be enforced, regardless.

**Table 5-4: Recommended piling periods denoted by green ticks and non-piling windows denoted by red crosses**

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SPAR Bridge	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
SPAR Viaduct	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
Marina (pontoon piles)	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
Area K Berth 45	✓	✓	✗	✗	✗	✓	✗	✗	✓	✓	✓	✓
Area K Ro-Ro ramp locating piles	✓	✓	✗	✗	✗	✓	✗	✗	✓	✓	✓	✓
Turning circle and temporary works piling	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
Area N outer piles x 5 rigs	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
Area N inner piles x 5 rigs	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
Area N inner piles x 5 rigs	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
ESB dolphin	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓

The mid-summer non-piling window (July-August) is designed to protect the period of peak grilse return. This becomes particularly important in the later part of that window during very, dry warm years, when salmon may be unable to migrate into the freshwater section of the Liffey above the Islandbridge weir which was observed to be the case in late August 2022. In these situations, it has been shown that salmon will delay below such barriers where they are more exposed to predation or poaching and if they sometimes drop back down the estuary, which has been observed in some UK estuaries, they could become exposed again to piling noise if that is ongoing at the time.

### 5.3.1.2.2 Operational Phase

#### Channel Maintenance Dredging Works

Maintenance dredging is an ongoing requirement in the port and new licences will be required to cover maintenance of the areas newly dredged in capital dredging works under the 3FM Project. Conditions set in any Marine Area Consent (MAC) and Dumping at Sea Permit will prescribe strict environmental protection measures. Maintenance dredging will implement comprehensive mitigation measures as set out below:

- Loading will be carried out by a backhoe dredger or trailing suction hopper dredger (TSHD).
- No over-spilling from the vessel will be permitted while the dredging activity is being carried out within the inner Liffey Channel.
- The TSHD pumps will be switched off while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of fish entrainment.
- The dredger's hopper will be filled to a maximum of 4,100 cubic metres (including entrained water) to control suspended solids released at the dumping site. This is equivalent to a maximum quantity per trip of 2,030 tonnes (wet weight).

- Full time monitoring of Marine Mammals within 500m of loading and dumping operations will be undertaken in accordance with the measures contained in the Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters (NPWS, 2014).
- A documented Accident Prevention Procedure will be put in place prior to commencement.
- A documented Emergency Response Procedure will be put in place prior to commencement.
- A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip.
- Dumping will be carried out through the vessel's hull.
- The dredger will work on one half of the channel at a time within the inner Liffey channel to prevent the formation of a silt curtain across the River Liffey.
- When any dredging is scheduled to take place within a 500m radius of power station intakes, the relevant stakeholders will be notified so that precautionary measures can be taken if deemed necessary.

Assuming the above mitigation measures are employed during maintenance dredging and disposal operations, the potential impact to receiving water environment will be reduced to *negligible* thus reducing the significance of environmental effect will be reduced to *Imperceptible*.

### **Washwater from Exhaust Gas Cleaning System (EGCS)**

DPC will continue to enforce the Marine Notice (Notice to Mariners (No 26 of 2021) – Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water) prohibiting the discharge of EGCS effluent from existing and new vessels resulting from the 3FM Project into Dublin Port jurisdictional waters until such time as EGCS may be conclusively proven not to impact water or sediment quality. This will ensure that new and larger vessels using the port as a result of the greater capacity offered by the 3FM Project will not have the potential to impact on the water quality of the Lower Liffey Estuary, Dublin Bay or the Tolka Estuary.

In circumstances where the above mitigation measures listed are employed, the potential impact to receiving water environment will be reduced to negligible thus reducing the significance of environmental effect will be reduced to *Imperceptible*.

### **General Operational Activities**

Storm water runoff will be collected in a dedicated storm water drainage system and will not be permitted to discharge directly to the marine environment from new jetties, and hardstand areas. The surface water drainage system will consist, *inter alia*, of heavy-duty gullies cast into the reinforced concrete deck, with concrete pipes cast into the in-situ concrete deck structure. These pipes will carry the storm water to an appropriate full retention oil separator for the Port Operations at Area K, Area N and Area O which will trap oils and silt prior to being discharged into the harbour waters through a non-return flap valve. Drainage from the new SPAR Road, bridge and viaduct will be via by-pass oil interceptors given the reduced risk associated with these areas. Sustainable Urban Drainage Systems (SuDs) are not proposed due to limited space and the industrial nature of the operations. A readily and safely accessible monitoring chamber will be

provided on the storm water pipeline as appropriate to allow for inspection and sampling of the storm water being discharged.

The oil interceptors on the surface water drainage network will be selected and sized based on the pollution prevention guideline: “Use and design of oil separators in surface water drainage systems: GPP3 and BS EN 858 which is the European Standard for the design, performance, testing, marking and quality control of separators within the EU. All separators must comply with this standard. In accordance with GPP3 a class 1 bypass separator will be required for general road and car parking areas of the site whilst a class 1 full retention separator will be required for the HGV parking and loading areas within Area K, Area N and Area O.

Foul water from the proposed development will be serviced by a dedicated foul sewer system which will connect to the Uisce Éireann sewer network in the vicinity of the works, the Rathmines to Pembroke 1,500mm sewer. Part of this sewer will require diversion around Area K which will be undertaken in advance of the operation of the 3FM Project. The additional loading from the development can be accommodated within the Ringsend Agglomeration without any significant impact on the existing operations in the agglomeration or the ability to achieve the required discharge emission limit values under the wastewater discharge licence.

The 3FM Project, when complete, will be subject to the port’s existing Environmental Management System (EMS) which is accredited to the Port Environmental Review System (PERS) which has gained Dublin Port designation as an ‘EcoPort’ at European level.

The EMS comprehensively identifies environmental aspects and impacts relating to Dublin Port including Tenant operations. Regular review of environmental aspects is required and will facilitate incorporation of any 3FM Project-specific issues that may arise with implementation of mitigation, as necessary. The EMS is supported by a comprehensive suite of Standard Operating Procedures (SOP) providing mitigation of all environmental aspects identified and mechanisms to ensure effective implementation. SOPs have been prepared for oil and chemical spill responses, mineral oil handling, waste handling, monitoring and maintenance of surface water interceptors and handling of drain cleaning waste. Controls are in place for transport, handling and storage of hazardous materials, ship cargo, dry bulk material, surface water runoff, fuelling and bunkering of vessels and ship discharges. Site audits promote best practice and ensure compliance with the EMS requirements.

In circumstances where the mitigation measures listed above are employed, the potential impact to receiving water environment will be reduced to *negligible* thus reducing the significance of environmental effect will be reduced to *Imperceptible*.

### **Changes in the hydromorphological supporting conditions within the Lower Liffey Estuary**

The risk of impact to the tidal regime is generally determined to be negligible, however increased current speeds as a result of the SPAR bridge development could result in scouring of the seabed around the proposed SPAR bridge foundations during periods of extreme river flow discharge conditions. To mitigate the



operational phase impact of the SPAR bridge development suitable scour protection should be developed and implemented within the immediate vicinity of the proposed development.

The impact of the operational stage of the 3FM Project on hydromorphology and the WFD ecological potential for the Liffey Estuary Lower is assessed as negligible due to the mitigation by design already incorporated into the project. The significance of the effect is therefore imperceptible, and no further mitigation is required.

### 5.3.2 Deterioration in water body status

The latest status reporting period is based on data from 2016-2021 and was published in 2023. This water body classification is the baseline from which deterioration is not permitted and therefore, this is the status classification that must not deteriorate when considering the impact of Project on the 'no deterioration of water body status objective.

The detailed assessment demonstrates that taking into consideration the mitigation measures committed to through the various management plans outlined above will ensure that there will be no deterioration in the individual elements of ecological and chemical status and therefore, no deterioration in the overall WFD status classification outlined in Section 3.2 of this report.

#### 5.3.2.1 Ecological Status

##### 5.3.2.1.1 Supporting Hydromorphological Conditions - Mitigation Measures for Hydromorphological Impacts

The Mitigation Measures Library detailed in CIS Guidance Document No. 37 (Steps for defining and assessing ecological potential for improving comparability of Heavily Modified Water Bodies) lists 12 mitigation measure categories that are relevant across EU Member States, including Ireland, and for which a toolbox of measures has been developed to address hydromorphological pressures as far as practical whilst still retaining the specified use of the water body. The design of the 3FM Project has considered these mitigation measures and has adopted measures where relevant. Key groups of measures listed in the EU toolbox of mitigation measures that are applicable to the 3FM Project are summarised in Table 5-3. Incorporation of relevant measures during design and development of the 3FM Project will ensure that the project will contribute to the achievement of good ecological potential during the operational phase.

This is supported by the analysis undertaken in Chapter 13 Coastal Processes which has concluded that:

- The tidal regime will remain substantially unchanged post 3FM Project and no notable changes to the tidal regime were detected outside of Dublin Port. Given the localised nature and small absolute magnitude of any predicted changes in tidal current velocity it is unlikely that there will be any significant change in net scouring or deposition of sediments within the Liffey Estuary Lower and Dublin Bay resulting from the 3FM Project.
- The risk of impact to the tidal regime is generally determined to be negligible, however increased current speeds as a result of the SPAR bridge development could result in scouring of the seabed

around the proposed SPAR bridge foundations during periods of extreme river flow discharge conditions. To mitigate the operational phase impact of the SPAR bridge development suitable scour protection should be developed and implemented within the immediate vicinity of the proposed development. The risk of impact to the existing tidal regime is therefore determined to be negligible because of the measures incorporated into the design and no further mitigation is required.

- The assessment of potential changes to the inshore wave climate found that the maximum change in wave heights in Dublin Port during storm events did not exceed  $\pm 0.20\text{m}$ . These changes were confined primarily to Poolbeg Marina and Area N. There was no discernible change in the wave climate due to the 3FM Project in relevant proximate areas such as Clontarf, Fairview and Ballybough bordering the Tolka Estuary. These changes to the wave climate are not considered significant and will not impact on the overall supporting hydromorphological conditions in the Liffey Estuary Lower, Dublin Bay or the Tolka Estuary.
- A minor change to the dispersion of thermal plume envelopes is observed within the immediate vicinity of Area N which can be attributed to the influence of the proposed piling in this area which results in a very marginal decrease in thermal dispersion in this area. Importantly, this will not result in a significant change to the ambient water temperatures in the Liffey Estuary Lower outside the immediate vicinity of the piling. The change in water temperatures at the Poolbeg intakes as a result of the 3FM Project was found to reduce the average temperature at the Poolbeg intake in the surface and bottom layers of the water column by  $0.14$  and  $0.03^{\circ}\text{C}$  respectively.
- Given that there are no significant changes to key coastal processes that govern sediment transport, i.e., tides, waves and water levels, it can be concluded that the 3FM Project will result in no discernible change to the existing sediment transport regime in the Liffey Estuary Lower and the in the greater Dublin Bay area.

#### **5.3.2.1.2 Biological quality elements (BQE) that are not sensitive to the hydromorphological modification.**

In the case of the Liffey Estuary Lower, the most recent WFD biological monitoring (2016-2021), as reported by the EPA<sup>3</sup> indicates that biological elements not achieving good ecological status are predominantly sensitive to organic and nutrient enrichment. The significant pressures in the Liffey Estuary Lower have been identified as urban wastewater pressures. Implementation of the 3FM Project will not significantly increase urban wastewater pressures nor will it introduce new impediments to the achievement of good ecological potential when the mitigation measures are implemented.

The Tolka\_060, Dodder\_050 river water bodies, the Tolka Estuary, Liffey Estuary Upper are all failing to achieve good ecological status predominantly due to urban wastewater and diffuse urban run-off pressures.

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[https://www.catchments.ie/data/?\\_gl=1\\*625lbd\\*\\_ga\\*MTQyOTMyODAwNi4xNjk1NzZM2NTU2\\*\\_ga\\_TPK2CK9KEX\\*MTY5NjUxNTQ3NS40LjEuMTY5NjUxNTQ3Ni4wLjAuMA.#/waterbody/IE\\_EA\\_090\\_0300?\\_k=afryth](https://www.catchments.ie/data/?_gl=1*625lbd*_ga*MTQyOTMyODAwNi4xNjk1NzZM2NTU2*_ga_TPK2CK9KEX*MTY5NjUxNTQ3NS40LjEuMTY5NjUxNTQ3Ni4wLjAuMA.#/waterbody/IE_EA_090_0300?_k=afryth)

The 3FM Project will not increase the urban wastewater pressures as it is not anticipated that there will be any significant increase in the peak wastewater discharge or loading to the public sewer as a result of the development. Diffuse urban run-off from the development areas including quayside, Maritime Village, SPAR Road and Spar Viaduct will all have adequate surface water drainage controls as outlined in Section 0.

Furthermore the mitigation measures as proposed through the design and best practice measures outlined in Section 5.3.1 will ensure that the construction activities and operation of the 3FM Project will not prevent the achievement of good ecological status/potential in all water bodies within the study area and will ensure that Dublin Bay coastal water body, which is currently achieving its environmental objective of good ecological status, will not deteriorate in status.

### **5.3.2.1.3 Biological quality elements that are sensitive to the hydromorphological modification**

The Mitigation Measures Library (EU CIS Guidance No. 37) library was consulted for Transitional and Coastal water bodies to determine the likely effects of a particular pressure on the ecological conditions of a water body. The key biological elements that are sensitive to hydromorphological alterations associated with the 3FM Project (i.e. quay walls, vertical piling, and dredging) are fish, benthic invertebrates, angiosperms and macroalgae.

Shoreline surveys were carried out in June and July 2023 (Chapter 7, Section 7.2.2 Intertidal Surveys) along the south side of the Liffey Estuary from Tom Clarke Bridge in the west to just east of the ESB/Ringsend discharge at the base of the Great South Bull Wall, a straight-line distance of approximately 3km. Habitat substrates along this stretch are 38% rock armour/ rock rubble intertidal, 45% sheet pile wall and 17% stone wall. This entire shore has been manmade at some stage in the recent centuries.

The supralittoral along rock revetments/rock rubble shores supports a sparse flora dominated by ruderal angiosperms, many of which are non-native species. Angiosperms are otherwise limited on building and artificial surface habitats that dominate the supralittoral shoreline in this area.

Within the Lower Liffey, the intertidal habitat is relatively sheltered from direct wave action and is therefore dominated by furoid (brown) algae and the typical associated intertidal mobile and attached invertebrate fauna. This shore community is typical of sheltered rocky intertidal shores but with reduced diversity probably due to a lack of microhabitats, and the influence of several local freshwater inputs.

Floating gangways and berths at the Poolbeg Marina support a mixed epibiotic flora and fauna, providing a microhabitat for small mobile crustaceans.

A number of migratory fish species pass through the Liffey estuary, including salmon, eel and lamprey. These are unlikely to be impacted by any of the hydromorphological issues considered here. The Water Framework Directive Fish Monitoring Programme conducted by Inland Fisheries Ireland has recorded a range of common marine/estuarine species in the Liffey estuary.

The algal, fish and benthic invertebrate communities outlined above have the potential to be affected by hydromorphological alterations associated with the 3FM Project. In terms of the benthic ecology Chapter 7

has concluded that *“much of the adverse change will be offset by more positive changes, namely the introduction of new hard surfaces which are likely in the main to be rapidly colonised by both estuarine and marine flora and fauna”*. Furthermore Chapter 7, Biodiversity, concludes that the importance of the Lower Liffey as a locally important nursery ground for estuarine/marine residents and migrants will remain substantially intact and fully functional and its role as a conduit for inwardly and outwardly migrating anadromous and catadromous species for the wider River Liffey catchment will remain fully intact.

Chapter 13, Coastal Processes has concluded that where the mitigation measures are fully implemented during the construction and operational phases, as presented in Section 5.3.1, the impact of the 3FM Project on the coastal processes within Liffey Estuary Lower, Dublin Bay and wider areas will consist of small scale, low magnitude changes in the tidal regime and wave climate. On the basis that the appropriate mitigations measures are fully implemented during the construction and operational phases, the impact of the 3FM Project on coastal processes will be imperceptible. Therefore, based on the above analysis and the design of the 3FM Project there are no perceptible changes in the hydromorphological conditions and the ability of the Liffey Estuary Lower to achieve good ecological potential. The project has incorporated mitigation measures as is required under the WFD and will not impact on the other elements of ecological status that are not sensitive to hydromorphological changes. The impact of the operational stage of the 3FM Project is therefore negligible. Accordingly, the significance of the effect is imperceptible, due mainly to the mitigation by design, based on the extremely high sensitivity of the receiving environment.

#### **5.3.2.1.4 Physico-Chemical Conditions**

Alteration of general physico-chemical conditions downstream of major hydromorphological alterations can occur (e.g. temperature, dissolved oxygen supersaturation). Current WFD monitoring for general physico-chemical conditions indicates that such impacts are not evident within the Liffey Estuary Lower, and therefore the specified use for this HMWB, port navigation, is not having a significant impact on ambient physico-chemical conditions. The design of the 3FM development and the best practice mitigation measures proposed will ensure its construction and operation will not impact on coastal processes, i.e. wave climate, tidal regime and flow conditions and thermal plume and therefore will not affect the physico-chemical supporting conditions. This is supported by the ongoing monitoring regime being implemented for the MP2 and Alexandra Basin Redevelopment projects (EIAR, Chapter 9, section 9.1.2.8).

#### **5.3.2.2 Chemical Status**

A programme of sediment quality sampling and analysis within the Dublin Port area (EIAR, Chapter 8) has shown that that the sediments to be dredged as part of the 3FM Project are suitable for conventional dumping at sea (subject to the granting of a Dumping at Sea Permit by the EPA) with the exception of an estimated 70,000m<sup>3</sup> of dredge material from the area of Poolbeg Marina is not suitable for disposal at sea due to the presence of heavy metals, Polychlorinated Biphenyls (PCBs) and Polyaromatic Hydrocarbons (PAH).

The options for disposal of the Class 2 element of dredged sediment from the Maritime Village / Marina, in order of preference, are:

1. Filled to berth 52/53 under a revised IE licence subject to availability of receptor capacity;
2. Recovered at a soil recovery or soil treatment facility in Ireland subject to testing of the sediments in line with the selected facility licence at the time of the works;
3. Recovered at a soil treatment facility in Great Britain or northern Europe;
4. Disposed of at a licenced landfill facility in Ireland.

Therefore, there is no potential to impact on the supporting physico-chemical conditions or the chemical status of the Liffey Estuary Lower or Dublin Bay coastal water body.

During the construction phase there is the potential for accidental spillage or release of construction materials (e.g. diesel, oil, chemicals), It is also possible that residual contaminants may be mobilised during the demolition of the disused Poolbeg Oil Jetty resulting in a localised deterioration in water quality within the port area that could impact of the chemical status of the Liffey Estuary Lower, Dublin Bay, Tolka Estuary, Liffey Estuary Upper, Tolka\_060 and Dodder\_060 water bodies. However, the suite of mitigation measures proposed, as detailed in Section 5.3.1, will ensure the risk of this occurrence is very low and the 3FM Project will not result in a deterioration in the chemical status of the water bodies listed above.

### **5.3.2.3 Summary**

Table 5-5 provides the justification for this assessment for surface water bodies based on the different quality elements, the potential impacts scoped into the WFD assessment (Table 5-2) and mitigation measures for the Project (Section 5.3.1).

**Table 5-5: Summary of mitigation measures to ensure the surface water body status does not deteriorate**

Potential impact	Biological supporting elements			Hydro-morphological supporting elements		Physio-chemical supporting elements	Chemical		
	Fish	Invertebrates	Macrophytes	Hydrological regime	Morphology		Priority hazardous substances	Priority substances	
<b>Construction Phase</b>									
Suspended Sediment and Sedimentation	Suspended sediment and sedimentation can impact on substrate and biological elements that rely on this habitat. Suspended solids in the water column can also have an impact on mobile species, particularly fish. Overall, the resident estuarine and marine migrant fish population will experience some degree of sub-lethal stress and temporary and localised community disruption associated with elevated turbidity levels during the dredging process. The mitigation measures as proposed through the design and best practice measures outlined in Section 5.3.1 will ensure that the construction activities associated with the 3FM Project will not result in significant suspended solids or sedimentation above the current baseline and therefore will not impact significantly on the biological elements or prevent the achievement of good ecological status/potential of the biological elements in all water bodies within the study area and will ensure that Dublin Bay coastal water body, which is currently achieving its environmental objective of good ecological status, will not deteriorate in status.			Sedimentation can impact on the morphology of the channel impacting on the supporting hydromorphological conditions. The footprint of the development is within the Liffey Estuary Lower which is designated as a heavily modified water body and is subject to significant sediment loading from the upstream catchment. The measures proposed under Section 5.3.1 will ensure there will not be significant additional sediment loading from the construction activities associated with the 3FM Project which will impact on the hydromorphological supporting conditions and therefore prevent the achievement of good ecological status/potential in all water bodies within the study area. The measures will also ensure that Dublin Bay coastal water body, which is currently achieving its environmental objective of good ecological status, will not deteriorate in status.		Suspended sediment and sedimentation can impact on the oxygenation conditions, nutrients and temperature of a water body. As with the biological elements and supporting hydromorphological conditions the measures proposed in Section 5.3.1 will ensure that the supporting physico-chemical conditions will not be impacted by the proposed 3FM Project and therefore the ecological status will not deteriorate or be prevented from achieving its environmental objectives in all water bodies within the study area.		There is the potential for contaminants bound to suspended solids to drain into the harbour and estuary. As per physico-chemical supporting elements.	
Accidental release of highly alkaline contaminants from concrete and cement	High alkaline contaminants for concrete and cement can have a lethal (direct mortality through toxicity) and sub-lethal (reduced respiration, growth, reproduction) effects on fish, invertebrates, and their habitats. The mitigation measures as proposed through the design and best practice measures outlined in Section 5.3.1 will ensure that the construction activities associated with the 3FM Project will not result in accidental release of highly alkaline contaminants from concrete and cement and therefore will not impact significantly on the biological elements or prevent the achievement of good ecological status/potential in all water bodies within the study area and will ensure that Dublin Bay coastal water body, which is currently achieving its environmental objective of good ecological status, will not deteriorate in status.					Fresh concrete and cement are highly alkaline and therefore will affect water quality (particularly in terms of pH) if washed into the water body. The mitigation measures as proposed through the design and best practice measures outlined in Section 5.3.1 will ensure that the construction activities associated with the 3FM Project will not result in accidental release of highly alkaline contaminants from concrete and cement and therefore will not impact significantly on the supporting physico-chemical conditions.			
The impact of pollution caused by accidental spills/ release of contaminants from General Construction Activities	During the construction phase there is the potential for accidental spillage or release of construction materials (e.g. diesel, oil, chemicals). It is also possible that residual contaminants may be mobilised during the demolition of the disused Poolbeg Oil Jetty resulting in a localised deterioration in water quality within the port area. The mitigation measures as proposed through the design and best practice measures outlined in Section 5.3.1 will ensure that the construction activities associated with the 3FM Project will not result in accidental release of contaminants and therefore will not impact significantly on the biological elements or prevent the achievement of good ecological status/potential in all water bodies within the study area and will ensure that Dublin Bay coastal water body, which is currently achieving its environmental objective of good ecological status, will not deteriorate in status.					As per biological elements.		As per biological elements.	
Impact of pile driving on fisheries	The possibility that anthropogenic sound generated by pile driving, in particular impact pile driving, could adversely impact on fish. Mitigation for impact pile driving comprises two main approaches, mechanical mitigation and non-piling windows. Mechanical mitigation involves the use of methods to intercept the sound emanating from the pile and thereby reduce its power, while non-piling windows are designed to allow particularly threatened species to pass through the area of the piling operation without exposure to potentially detrimental sound levels. Details of these mitigation measures are provided in Section 0.								
Dredge spoil disposal at Burford Bank	The deposition of muds and sandy muds from the port area could result in potential smothering of the native sediment and invertebrates from the existing community below the deposited spoil. The reduction in biomass could also impact on fish feeding in this area. Fish living on or very close to					A programme of sediment quality sampling and analysis within the Tolka Estuary and Dublin Port area (Chapter 8) has shown that that the sediments to be dredged as part of the 3FM Project are suitable for conventional dumping at sea (subject to the granting of a Dumping at Sea Permit by the EPA) with the exception of an estimated 70,000m <sup>3</sup>			

Potential impact	Biological supporting elements			Hydro-morphological supporting elements		Physio-chemical supporting elements	Chemical	
	Fish	Invertebrates	Macrophytes	Hydrological regime	Morphology		Priority hazardous substances	Priority substances
	<p>the bottom, e.g., small dab, plaice, dragonet, lesser weever fish and gobies etc., immediately beneath the dredger hopper during a disposal event may be buried, killed or injured by the descending bulk spoil. The mitigation for dredging operations in the 3FM Project has been informed by the MP2 Project and the ABR Project monitoring and experience working in the same locations. A Dredging Management Plan, similar to that developed for the MP2 Project will be prepared and will include the measures outlined in Section 0.</p>					<p>of dredge material from the area of Poolbeg Marina is not suitable for disposal at sea and will require recovery or disposal to a non-hazardous landfill. The options for disposal of the Class 2 element of dredged sediment from the Maritime Village / Marina, in order of preference, are:</p> <ol style="list-style-type: none"> <li>1. Filled to berth 52/53 under a revised IE licence subject to availability of receptor capacity;</li> <li>2. Recovered at a soil recovery or soil treatment facility in Ireland subject to testing of the sediments in line with the selected facility licence at the time of the works;</li> <li>3. Recovered at a soil treatment facility in Great Britain or northern Europe;</li> <li>4. Disposed of at a licenced landfill facility in Ireland.</li> </ol> <p>Therefore, there is no potential to impact on the supporting physico-chemical conditions or the chemical status of the Liffey Estuary Lower, Dublin Bay coastal water body or any of the other water bodies within the study area.</p>		
<b>Operational Phase</b>								
Suspended Sediment and Sedimentation	<p>The annual sediment load entering the port from the upstream Liffey catchment, leading to deposition in the port, will not change significantly due to the 3FM Project. Therefore, maintenance dredging requirements to maintain the new channels and pockets should not differ substantially from the current operational conditions. Any increase in suspended sediments and sedimentation due to maintenance dredging as a result of the 3FM Project is likely to be low and is assessed to have a localised minor adverse impact to water quality. Maintenance dredging is an ongoing requirement in the port and new licences will be required to cover maintenance of the areas newly dredged in capital dredging works under the 3FM Project. Maintenance dredging will implement the comprehensive mitigation measures which are part of every maintenance dredging campaign as detailed in Section 9.5.2 of the EIAR. Based on this assessment there is no potential to cause a deterioration in the ecological or chemical status or to prevent the achievement of the environmental objectives of the water bodies within the study area.</p>							
Washwater from Exhaust Gas Cleaning System	<p>DPC will continue to enforce the existing Marine Notice (Notice to Mariners (No 26 of 2021) – Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water) prohibiting the discharge of EGCS effluent from existing and new vessels resulting from the 3FM Project into Dublin Port jurisdictional waters until such time as EGCS may be conclusively proven not to impact water or sediment quality. This will ensure that new and larger vessels using the port because of the greater capacity offered by the 3FM Project will not have the potential to impact on the water quality of the Lower Liffey Estuary, Dublin Bay or the Tolka Estuary. In circumstances where the above existing measure is continued to be employed, the potential impact to receiving water environment will be reduced to negligible thus ensuring the different elements contributing to the ecological and chemical status of the water bodies within the study area will not deteriorate nor will the project compromise the environmental objectives of any of these water bodies.</p>							
General Operational Activities	<p>Surface water drains installed in new hardstand areas, the SPAR road, and the reconfigured road network will be serviced by full retention oil separators before discharge which will ensure that pollutants from these surfaces are removed prior to discharge to the Liffey Estuary Lower, Tolka_060 and Dodder_050. The removal of any pollutants will ensure the biological elements of the ecological status of these water bodies will not be affected and the water bodies will not be prevented from achieving their environmental objectives. Maintenance dredging is included above under suspended sediment and sedimentation.</p>			<p>The surface water drainage system will have outfalls which discharge to the Liffey Estuary Lower at the shoreline, however the construction of these new outfalls will occur on an already modified section of the coastline and will not introduce new hydromorphological pressures to this transitional water body or any of the other water bodies in the study area.</p>		<p>As per biological elements</p>		
Changes in the hydromorphological supporting conditions through habitat alterations impacting on ecological status	<p>The Liffey Estuary Lower is a designated HMWB however there is still a requirement to achieve good ecological potential which, as outlined in section 3.3.2, requires the biological elements which are not sensitive to hydromorphological impacts to achieve good status and those that are sensitive must achieve at least the best condition since the modifications were put in place (which in the case of the Liffey Estuary Lower is good ecological status). The mitigation measures proposed as part of the 3 FM project and detailed in Section 5.3.1 will ensure that the introduction of new structures in into the Lower Liffey Estuary will not compromise the achievement of good ecological status for those biological elements that are now sensitive to hydromorphological pressures. Furthermore the project will not prevent the biological elements that are sensitive to hydromorphological pressures, e.g. fish from achieving the best conditions since the modifications to the Liffey Lower Estuary where established.</p>			<p>Even though the Liffey Estuary Lower is a heavily modified water body it still needs to achieve good ecological potential and based on the approach that Ireland is adopting as outlined in section 3.3, measures to mitigate the impacts from hydromorphology should be considered in these water bodies, including the potential impacts on coastal process and how these could impact on the supporting hydromorphology conditions. The mitigation measures that have been included in the design of the 3FM Project (Table 5-3) ensure that appropriate mitigation from the EU toolbox of mitigation measures have been applied to the design of the 3FM Project and it will therefore not compromise the achievement of good ecological potential in the Lower Liffey Estuary transitional water body or in any of the other water bodies in the study area.</p>		<p>Changes in hydromorphology can impact on the physico-chemical supporting conditions of a water body including the temperature and dissolved oxygen levels, however the measures included within the 3FM Project design will ensure that changes to the supporting physico-chemical conditions of the water bodies in the study area will not be affected.</p>		

### 5.3.3 Protected area objectives

A number of protected areas, listed on the register are located within the WFD assessment study area of the Project. These protected areas have their own monitoring and assessment requirements to determine their condition. They are often assessed for additional pollutants or requirements relevant to their designation. For example, faecal coliform levels are assessed within shellfish and bathing waters. Therefore, it is important that the standards required for these protected areas are also met. If they are not met, a water body which would otherwise meet the requirements of the WFD, may have the status reduced to 'less than good' as it is not meeting the protected area objectives. The water bodies within the Project study area that contain protected areas listed in the register of protected areas are detailed in Section 3.4. The protected areas linked to the water bodies within the WFD assessment study area for the Project area include bathing waters in the Dublin Bay coastal water body, Nutrient Sensitive Area in Liffey Estuary and European sites in the Liffey Estuary Lower, Tolka Estuary transitional water bodies and Dublin Bay coastal water body.

#### 5.3.3.1 Recreational Waters (Bathing Waters)

The closest bathing waters are Dollymount Strand (900 m to the boundary of Project), Sandymount Strand (200m to the boundary of the Project) and Seapoint (5km to boundary of the Project) which currently have good, poor and excellent bathing water quality respectively as presented in Section 3.4.1. As reported by the EPA in the Bathing Water Quality Report for 2023 (EPA, 2024), the main sources of pollution resulting in the poor classification at Sandymount Strand are pathogens from misconnections and sewage overflows which contaminate streams flowing to the bathing water, dog fouling left on the beach, and birds. The Dublin Bay Bathing Water Taskforce (chaired by Dublin City Council) was established in 2019 to help identify and fix pollution sources impacting on bathing water quality in Dublin Bay, including Sandymount Strand. Uisce Éireann has made significant improvements to the wastewater network and work is ongoing to address urban wastewater pressures. The programme of measures in the RBMP and the work currently being undertaken by the Dublin Bay Bathing Water task force will not be compromised by the development of the 3FM Project.

During the operational phase there will be very limited additional organic loading from the 3FM Project to the Ringsend agglomeration and therefore the project will not increase the risk to the bathing waters in the vicinity of the Port. Nutrient and organic loads from the Project during construction will be limited with welfare facilities at the main compound and secondary compounds will be appropriately managed through the CEMP.

#### 5.3.3.2 Nutrient Sensitive Areas

The Urban Waste Water Treatment Regulations 2001, as amended (which transpose the Urban Wastewater Treatment Directive (91/271/EEC) into Irish law and update the Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations 1994, as amended) list nutrient sensitive waters in the Third Schedule. The Liffey Estuary from Islandbridge weir to Poolbeg Lighthouse, including the River Tolka basin and South Bull Lagoon has been designated as a nutrient sensitive area (Figure 3-4). Ringsend WWTP currently discharges in the Lower Liffey Estuary and is in the List of Priority Urban Areas (Uisce Éireann,



2024) where treatment must improve to resolve national environmental priorities. Upgrade of the treatment plant is proposed for completion by 2025.

The 3FM Project will connect to the foul water sewer network in the Ringsend agglomeration and ultimately to the Ringsend WWTP. The loading from the project will not be significant in the context of the overall loading to the agglomeration and the upgrade works currently being prioritised will ensure adequate capacity is available for any additional load, therefore the 3FM Project will not compromise the achievement of the standards required for the Liffey Estuary nutrient sensitive area.

### 5.3.3.3 Natura 2000 Protected Areas

Natura 2000 is a European network of important ecological sites. The EU Habitats Directive (92/43/EEC) places an obligation on Member States of the EU to establish the Natura 2000 network. The network is made up of Special Protection Areas (SPAs), established under the EU Birds Directive (79/409/EEC), and Special Areas of Conservation (SACs), established under the Habitats Directive itself. As illustrated in **Error! Reference source not found.**, the majority of the 3FM Project does not fall within any Natura 2000 site (i.e. SPA or SAC), however the licensed dumping area is within the Rockabill to Dalkey SAC which is designated for the marine Annex I qualifying interest, reefs, and the Annex II species *Phocoena phocoena* (harbour porpoise).

The potential of likely significant effects from the 3FM Project Natura 2000 or “European” sites has been considered extensively in the Screening for Appropriate Assessment and Natura Impact Statement submitted with the application for development consent in respect of the 3FM Project. For the reasons set out in the Appropriate Assessment Screening Report and Natura Impact Statement, the 3FM Project will not have any adverse effects on the qualifying interests of any European site.

### 5.3.4 Achievement of the WFD objectives

During the latest River Basin Management cycle characterisation of the water bodies to establish the key pressures and associated pathways that are resulting in a status classification of less than good status was determined. A programme of measures is then put in place to assist in the achievement of the WFD objectives. The key objective of the WFD was to achieve good ecological status or potential by 2015, however extended timelines can apply where there are justifiable reasons (e.g. due to issues with disproportionate cost, affordability, technical difficulties). In these instances, the objective for the achievement of good status may be the end the third river basin management cycle in 2027. Table 5-6 outlines the objectives for each water body within the WFD study area of the 3FM Project and the key quality elements driving the status. The significant pressures, where known, resulting in a status of less than good are summarised and the measures that are recommended in the draft RBMP to achieve the WFD objectives are identified. Currently there are several of the water bodies that are not achieving good status but the current environmental objectives are to achieve good status by the end of the third river basin management cycle, (i.e., 2027). The final column of Table 5-6 assesses the potential impact on the achievement of the WFD objectives and concludes for all water bodies that the Project will not prevent the achievement of the WFD objectives.

**Table 5-6: Significant Water Management Issues (SWMI), Source, Programme of measures and assessment of impact of the project on the WFD objectives.**

Water Body Name	Type	Overall Status	Driving Element	Significant Water Management Issue	Source Activity	RBMP Measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
Liffey Estuary Upper	Transitional	Moderate	Phytoplankton, Invertebrates and supporting hydromorphological conditions	Urban Waste Water	Ringsend Agglomeration	<ul style="list-style-type: none"> <li>Continue investment in wastewater infrastructure with Irish Water investing €1.022bn, over the period 2020-2024;</li> <li>DHLGH to ensure ongoing engagement with Irish Water on the requirements for the next investment period (2025-2029);</li> <li>EPA to carry out a review of Wastewater Discharge Licences;</li> <li>Irish Water's RBMP – Enhanced Ambition Programme to advance priority WWTP projects whose discharges have been identified as being significant pressures on water bodies and impacting on WFD objectives.</li> </ul>	Good by 2027	Extended	Article4(4) - Technical feasibility	<p>The significant pressures in the Liffey Estuary Upper relate to urban waste water pressures from the Ringsend agglomeration including the WTP and Combined Sewer Overflows.</p> <p>The loading from the project will not be significant in the context of the overall loading to the agglomeration and the upgrade works currently being prioritised under the RBMP measures will ensure adequate capacity is available for any additional load, therefore the 3FM Project will not compromise the achievement of the environmental objectives for this water body.</p> <p>As outlined above the 3FM Project design also incorporates a number of mitigation measures for the hydromorphological pressures introduced by the Project and the application of the best practice mitigation measures as outlined in Section 5.3.1 will ensure that the achievement of the WFD objectives are not compromised by the development.</p>
				Urban Waste Water	Combined Sewer Overflows (CSO)	<ul style="list-style-type: none"> <li>Ensure development of any new standards for Combined Storm Overflows emerging from an update to the Urban Wastewater Treatment Directive;</li> <li>Continue to develop and update the Gap Analysis as a tool to deliver environmental benefits for infrastructural planning.</li> </ul>				
Liffey Estuary Lower	Transitional	Moderate	Phytoplankton, Invertebrates and supporting hydromorphological conditions	Urban Waste Water	Ringsend Agglomeration	As per Liffey Estuary Upper	Good by 2027	Extended	Article4(4) - Technical feasibility	<p>The significant pressures in the Liffey Estuary Lower relate to urban waste water pressures from the Ringsend agglomeration including the WTP and Combined Sewer Overflows.</p> <p>The loading from the project will not be significant in the context of the overall loading to the agglomeration and the upgrade works currently being prioritised under the RBMP measures will ensure adequate capacity is available for any additional load, therefore the 3FM Project will not compromise the achievement of the environmental objectives for this water body.</p> <p>As outlined above the 3FM Project design also incorporates a number of mitigation measures for the hydromorphological pressures introduced by the Project into the Liffey Estuary Lower HMWB and therefore the design and the application of the best practice mitigation measures as outlined in Section 5.3.1 will ensure that the achievement of the WFD objectives are not compromised by the development.</p>
				Urban Waste Water	Combined Sewer Overflows (CSO)	As per Liffey Estuary Upper				
Dublin Bay	Coastal	Good	Not at risk	n/a	n/a	Protect	Good by 2027	Extended	Article4(4) - Technical feasibility	<p>This water body is currently achieving its environmental objective so the focus will be on ensuring it does not deteriorate in status. The construction and operation of the 3FM Project will not increase the risk of deterioration in the water body status given the design mitigation measures as outlined in Table 5-3 and the best practice mitigation measures as outlined in Section 5.3.1.</p>

Water Body Name	Type	Overall Status	Driving Element	Significant Water Management Issue	Source Activity	RBMP Measures	Objective	Derogation Type	Reason	Impact on WFD Objectives
Tolka Estuary	Transitional	Moderate	Phytoplankton, invertebrates and physico-chemical supporting conditions (Dissolved oxygen and nutrients)	Urban Waste Water	Combined Sewer Overflows (CSO)	<ul style="list-style-type: none"> <li>Ensure development of any new standards for Combined Storm Overflows emerging from an update to the Urban Wastewater Treatment Directive;</li> <li>Continue to develop and update the Gap Analysis as a tool to deliver environmental benefits for infrastructural planning.</li> </ul>	Good by 2027	Extended	Article4(4) - Technical feasibility	<p>The significant pressures in the Tolka Estuary relate to Combined Sewer Overflows from the Ringsend agglomeration. The 3FM Project will not introduce any further pressures of this nature to the agglomeration with the design ensuring that the foul and storm water systems are separate.</p> <p>The construction and operation of the 3FM Project will not prevent the achievement of the environmental objective of this water body given the design mitigation measures as outlined in Table 5-3 and the best practice mitigation measures as outlined in Section 5.3.1.</p>
Tolka_060	River	Poor	EPA have assigned poor status by modelling	Urban Run-off	Diffuse Sources Run-Off	<ul style="list-style-type: none"> <li>Develop recommendations for an implementation strategy for nature based Sustainable Urban Drainage Systems on a national scale;</li> <li>Provide interim guidance documentation to support the delivery of a greater focus on nature-based solutions in advance of a national implementation strategy;</li> <li>Establish a programme for the modelling and monitoring of rainwater run-off and overflows;</li> <li>Oversee the preparation of integrated urban drainage management plans.</li> </ul>	Good by 2027	Extended	Article4(4) - Technical feasibility	<p>Sustainable Urban Drainage Systems (SuDs) are not proposed due to limited space and the industrial nature of the operations. Drainage from the hardstanding areas associated with the terminal developments will be via full retention oil interceptors whilst the new SPAR Road, bridge and viaduct will be via by-pass oil interceptors given the reduced risk associated with these areas.</p> <p>With these measures in place the potential for impacts from urban run-off is not significant and therefore the 3FM Project will not prevent the achievement of the environmental objectives for this water body.</p> <p>As with the Tolka Estuary the 3FM Project will not introduce any further CSO pressures from the Ringsend agglomeration with the design ensuring that the foul and storm water systems are separate.</p> <p>The construction and operation of the 3FM Project will not prevent the achievement of the environmental objective of this water body given the design mitigation measures as outlined in Table 5-3 and the best practice mitigation measures as outlined in Section 5.3.1</p>
				Urban Waste Water	Combined Sewer Overflows (CSO)	<ul style="list-style-type: none"> <li>Ensure development of any new standards for Combined Storm Overflows emerging from an update to the Urban Wastewater Treatment Directive;</li> <li>Continue to develop and update the Gap Analysis as a tool to deliver environmental benefits for infrastructural planning.</li> </ul>				
Dodder_050	River	Moderate	Phytobenthos, Invertebrates and Fish	Anthropogenic Pressures	Unknown	Each local authority will conduct assessments of water bodies with unknown pressures (those not within priority areas for action) to identify the significant pressures in these areas with a high level of confidence.	Good by 2027	Extended	Article4(4) - Technical feasibility	As per the Tolka_060 river water body.
				Urban Run-off	Diffuse Sources Run-Off	As per Tolka_060				
				Urban Waste Water	Combined Sewer Overflows	As per Tolka_060				

## 6 SUMMARY

A WFD assessment has been undertaken for the 3FM Project. The assessment is based on guidance developed by the Environment Agency and Planning Inspectorate and is undertaken in a staged approach to ensure that those components of the project and the associated activities are assessed in the context of the quality elements that contribute to overall WFD status.

The key focus of the assessment was to ensure that the construction and operation of the 3FM Project does not result in a deterioration in the current WFD status of the water bodies within the WFD study area, based on the 2021 baseline as reported by the EPA based on the 2016-2021 WFD monitoring programme, and also to ensure that the project does not compromise the achievement of the WFD objectives for the improvement in the overall status of these water bodies. The assessment also considers the protected areas linked to the water bodies in question and ensures that the protected area objectives are also unaffected.

The scoping stage of the WFD compliance assessment has concluded that there were a number of components and activities associated with the Project that represented a risk to the WFD status and objectives and therefore were scoped into the assessment. The relevant quality elements contributing to the overall status were considered and how each potential impact could affect these.

The potential impact of the different components of the 3FM Project were assessed in the context of the environmental objectives for the water bodies affected. Mitigation measures included within the Project design and the application of a comprehensive suite of mitigation measures will ensure that there will be no significance effects on the WFD status of the water bodies within the study area.

The overall conclusion of the WFD compliance assessment is that there will be *no risk of deterioration* in status from the Project nor will it prevent of the achievement of the objectives for the relevant water bodies including the protected area objectives.

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