

## 8 WATER

### 8.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the existing environmental setting and the likely significant impacts on nearby water bodies, associated with the proposed residential development at Portmarnock South Phase 1D in the townlands of Drumnigh, Maynetown and Portmarnock, Portmarnock, Co. Dublin. The characteristics of the potential and predicted impacts during the Construction and Operational Phase of the Proposed Development are assessed and evaluated. Where an impact is identified, appropriate mitigation measures to avoid any identified significant effects to surrounding water bodies are recommended and the residual impacts of the Proposed Development post-mitigation are assessed.

The Proposed Development (Phase 1D) which consists of 172no. residential units, described in detail in Chapter 3: Description of Proposed Development and in Section 8.4 below are situated on lands designated for new residential communities in accordance with the Portmarnock South Local Area Plan 2013 (as extended).

This assessment was drafted by Colman Horgan, Chartered Engineer who is an Associate with J.B. Barry and Partners with over 35 years' experience in civil and structural engineering, during which time he has assisted in the preparation of planning applications, EIAR's, Part 8 Applications and presented evidence at CPO and Oral Planning hearings.

### 8.2 Assessment Methodology

The assessment has been carried out generally in accordance with the following guidelines: -

- Construction Industry Research and Information Association (CIRIA, 2001). Control of Water Pollution from Construction Sites.
- Construction Industry Research and Information Association (CIRIA, 2002). Environmental Handbook for Building and Civil Engineering Projects.
- Environmental Protection Agency (EPA, 2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Environmental Protection Agency (EPA, 2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- The Planning System and Flood Risk Management Guidelines (DECLG/OPW, 2009).
- National Roads Authority (NRA, 2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

Resources relied on to prepare this chapter of the EIAR include: -

- Portmarnock South Local Area Plan (Adopted and Extended) July 2013 published by Fingal County Council.
- The historic flood data was obtained from the National Flood Hazard Mapping website [www.floodmaps.ie](http://www.floodmaps.ie).
- The Subsoil and Aquifer vulnerability data was obtained from the Geological Survey of Ireland website [www.gsi.ie](http://www.gsi.ie).
- The Preliminary Flood Risk Assessment (PFRA) map was obtained from the Catchment Flood Risk Assessment and Management study website [www.cfram.ie](http://www.cfram.ie).
- Greater Dublin Strategic Drainage Study (GSDSDS) – 2005.
- Dublin Coastal Flooding Protection Project (DCFPP) – 2005.
- Irish Coastal Protection Strategy Study (ICPSS) Phase III – 2008.

- Fingal East Meath Flood Risk Assessment and Management Study (FEMFRAM Study),
- The Rivers of Dublin – New Revised Edition 2017.
- Latest EPA Maps & Catchment Water Quality Data for watercourses in the area. <https://gis.epa.ie/EPAMaps/> and [www.catchments.ie](http://www.catchments.ie).
- Liffey Catchment Assessment 2010-2015 (HA 09) published by EPA Catchment Science & Management Unit.
- Irish Water website – [www.irishwater.ie](http://www.irishwater.ie).
- Portmarnock South Phase 1D Flood Risk Assessment (J. B. Barry and Partners – November 2021).
- Proposed Residential Development at Portmarnock South – Phase 1D Water Services Report (J. B. Barry and Partners – October 2021).

This assessment of impacts follows guidelines established by the Transport Infrastructure Ireland (formerly National Roads Authority before merger with Railway Procurements Agency) in its Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (2009).

The significance of impacts on specific receptors are considered in terms of the magnitude of the effect / impact of an element of the project on a receptor and the importance of that receptor.

The Criteria for rating the importance of Environmental Attributes are listed in the table below.

Importance	Criteria	Typical Example
<b>Extremely High</b>	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
<b>Very High</b>	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
<b>High</b>	Attribute has a high quality or value on a local scale	Salmon fishery. Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities.
<b>Medium</b>	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes. Quality Class C (Biotic Index Q3, Q2-3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.

<b>Low</b>	Attribute has a low quality or value on a local scale	<p>Locally important amenity site for small range of leisure activities.</p> <p>Local potable water source supplying &lt;50 homes.</p> <p>Quality Class D (Biotic Index Q2, Q1).</p> <p>Flood plain protecting 1 residential or commercial property from flooding.</p> <p>Amenity site used by small numbers of local people.</p>
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**Table 8.1:** Criteria for Rating Site Importance of Hydrogeological Features

Potential impacts are then categorized based on their effect on the integrity of the attribute both whole or in part, as listed below.

Magnitude of Impact	Criteria
<b>Large Adverse</b>	Results in loss of attribute and /or quality and integrity of attribute
<b>Moderate Adverse</b>	Results in impact on integrity of attribute or loss of part of attribute
<b>Small Adverse</b>	Results in minor impact on integrity of attribute or loss of small part of attribute
<b>Negligible</b>	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity

**Table 8.2:** Criteria for Rating Impact Significance at EIS Stage.

Finally, the combination of the importance of the attribute with the magnitude of the impact is used to determine the significance of the potential environmental impact, as categorized below.

Importance of Attribute	Magnitude of Impact			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
<b>Extremely High</b>	Imperceptible	Significant	Profound	Profound
<b>Very High</b>	Imperceptible	Significant / Moderate	Profound / Significant	Profound
<b>High</b>	Imperceptible	Moderate / Slight	Significant / Moderate	Profound / Significant
<b>Medium</b>	Imperceptible	Slight	Moderate	Significant
<b>Low</b>	Imperceptible	Imperceptible	Slight	Slight / Moderate

**Table 8.3:** Rating of Significant Environmental Impacts.

### 8.3 Receiving Environment

The lands, within which this Proposed Development is located, are part of Portmarnock South and covered by the Local Area Plan (LAP) for same, adopted in 2013 and extended in 2018.

The Portmarnock South LAP Lands are located to the west of Baldoyle Bay, to the east of the Dublin-Belfast Rail Line, north of Moyne / Mayne Road and south of Station Road.

These lands are being developed, primarily as residential development, on a phased basis, with Phase 1A constructed in 2016 / 2017 (101no. units), Phase 1B (which included the regional wetland described below) constructed in 2020 (150no. units) and Phase 1C, (153no. units and a Local Centre), which is currently under construction.

The Proposed Development is described below and for the purposes of cumulative assessment will include the current phase under construction (Phase 1C) and the development of future phases to build out approximately 507no. residential units including public open space, integration of recorded monuments and provision of road and drainage infrastructure.

A number of existing dwellings are present on the periphery of the Portmarnock South LAP Lands, namely five houses in the north-east opposite the junction of Station Road, Strand Road and Coast Road as well as three houses further south along Coast Road.

Newly developed residential areas are also present to the west of the Dublin – Belfast Rail Line, to the north of Station Road (including some apartments under construction) and Portmarnock Village itself, located to the northeast of the subject lands across the Sluice River.

### 8.3.1 Portmarnock South Lands Hydrology

For the purpose of implementing the Water Framework Directive, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine/coastal areas.

The Portmarnock South area falls within the Eastern River Basin District and the subject lands lie within the Water Framework Directive Catchment 09 'Liffey and Dublin Bay' and within the Water Framework Directive River Sub Basins 'Sluice\_010' to the north and 'Mayne\_010' to the south.

The River Liffey Catchment includes 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 eastern part of this catchment is drained by several small coastal streams and of relevance here are the northern streams i.e. the Sluice, Mayne and Santry Rivers.

The Sluice River, which rises to the north of Dublin Airport and flows by way of Kinsealy, lies approximately 600m to the north of the Proposed Development (150m with respect to upgrade works to interim foul pumping station) and outfalls into the head of Baldoyle Bay at Portmarnock Bridge.

The southern part of the lands is connected to the Mayne River via an open ditch which runs parallel to and then crosses the Moyne Road. The Mayne River, which rises near Dublin Airport, lies approximately 600m to the south of the Proposed Development, also discharges to Baldoyle Bay at the Coast Road (R106), to the south of the Moyne Road / Coast Road junction.

Baldoyle Bay/Mayne Estuary (located 700m to the east of the Proposed Development) is a tidal estuarine bay protected from the open sea by a large sand-dune system and is both a Special Area of Conservation (SAC) – Site Code 000199, designated under the Habitats Directive and a Special Protection Area (SPA) – Site Code 004016, designated under the Birds Directive.

We note the Natura Impact Statement (NIS) which accompanies this SHD Planning Application includes the Malahide Estuary (004025) and North Bull Island (004006) for appraisal as well as the protected sites listed in Table 7.1 below, however they go on to note that *There is no potential for habitat loss within the SPA or for impacts via emissions to surface water.* Therefore, they are not included in this assessment.



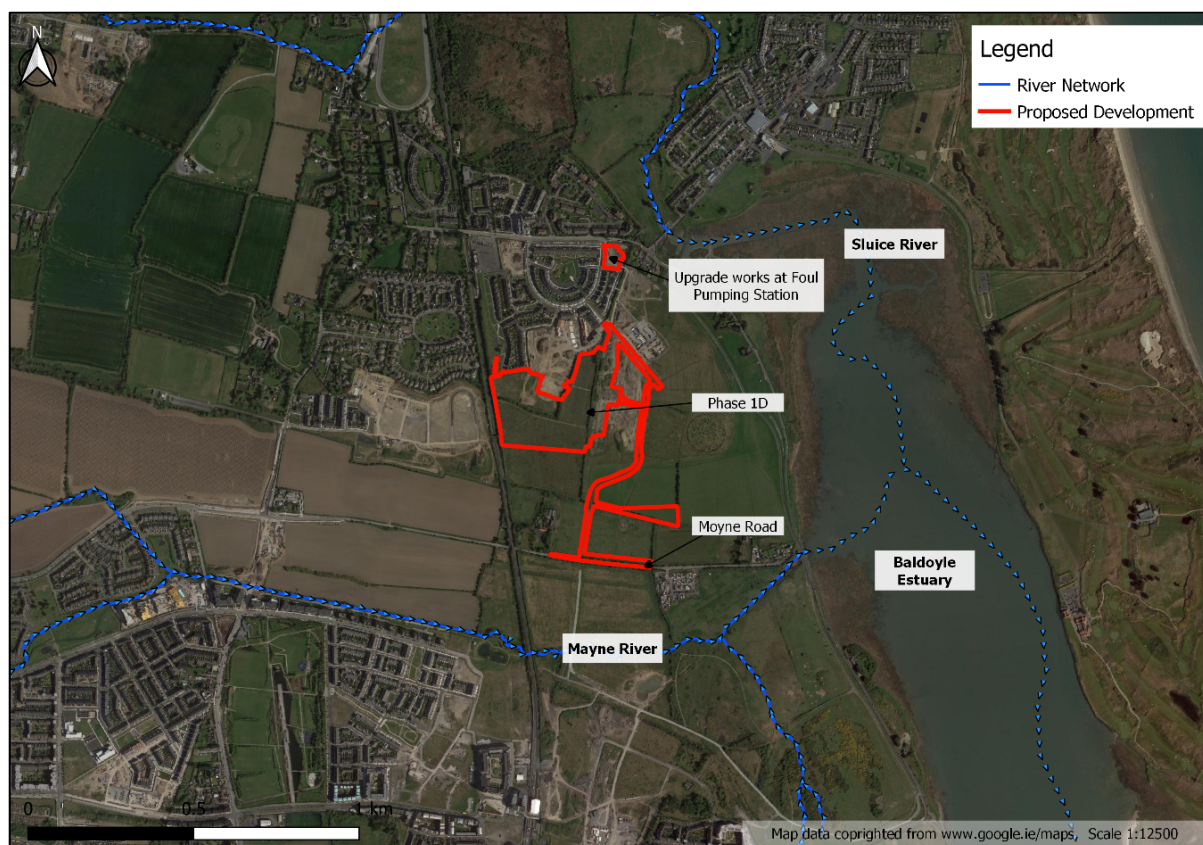


Figure 8.1: Hydrological Features of the Area (Source: EPA Map Viewer, annotation by J.B. Barry & Partners).

### 8.3.2 Water Quality

In 2000, the European Parliament and Council adopted 2000/60/EC – the Water Framework Directive (WFD). This establishes the legal framework for the protection, improvement and sustainable management of, inland surface waters, transitional waters, coastal waters and groundwater. The WFD was transposed into Irish law by the European Communities Water Policy Regulations 2003 (S.I. 722 of 2003). The key objectives of this directive are: -

- Prevention or limit the input of pollutants into groundwater and prevent deterioration of the status of all bodies of surface and groundwater.
- Protect, enhance and restore all bodies of surface and groundwater with the aim of achieving good status by 2015.

The key hydrological features in the vicinity of the Proposed Development are: -

- Sluice River to the north of the site which inputs flow to the Baldoyle – Mayne Estuary.
- Mayne River to the south of the site which inputs flow to the Baldoyle – Mayne Estuary.
- The Baldoyle – Mayne Estuary, a transitional receiving waterbody which both receives flows from, and discharges flows to the Irish Sea.
- Irish Sea – Dublin (HA 09).

The table below summarises the status and risk of each of these hydrological features based on data available on the EPA Maps website: -

Waterbody	Code	Type	Protected	WFD Risk	Ecological Status	Importance
Sluice River	IE_EA_09S071100	River	No	Under Review	Unassigned	Medium*
Mayne River	IE_EA_09M030500	River	No	At Risk	Poor	Medium*
Mayne Estuary	IE_EA_080_0100	Transitional	Yes	Under Review	Unassigned	Extremely High
Irish Sea – Dublin	IE_EA_070_0000	Coastal	N/A	Not at Risk	Good	-

\* Based on River Quality Attribute

Table 8.4: Status of Hydrological Features in proximity to Proposed Development.

### 8.3.3 Local Drainage Network & Flow Paths

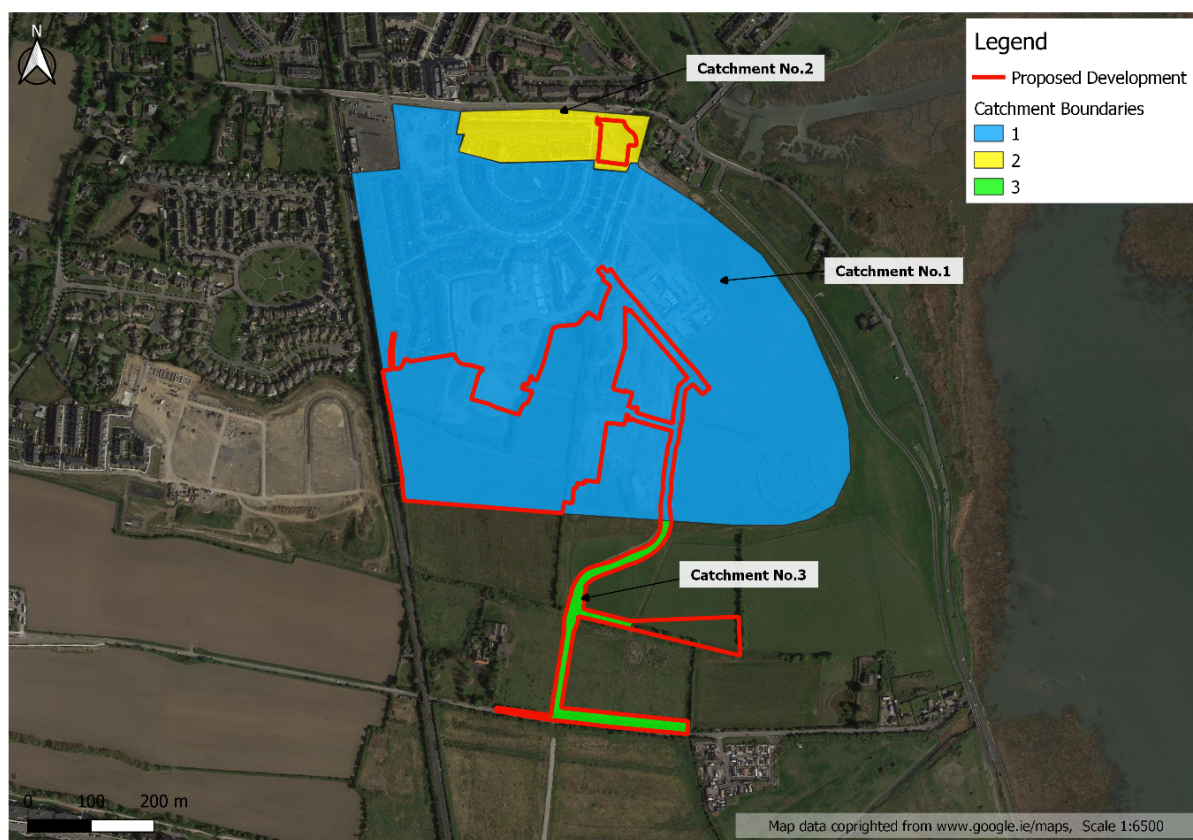
The lands slope to the north towards the Sluice River, to the east towards the Mayne Estuary and to the south towards the Mayne River. The site generally falls from a high contour of +15m OD mid-way (and within the Proposed Development) along the western boundary adjoining the rail line to a +12m OD contour in the centre of the site. The ground levels around the perimeter are typically; +10m OD contour in the northwest by the railway station, +4.5m OD contour in the northeast adjoining Station Road, falling to +3.7m OD contour toward the estuary and +3.0m OD contour in the southeast along Moynes Road.



Figure 8.2: Topographical Slopes.



Under previous phases of development, the lands contained within the Portmarnock South LAP were divided into three principal catchments as indicated in the figure below.



**Figure 8.3:** Catchment Areas

Catchment No. 2 (1.55 Ha) which drains an earlier phase of the development (Phase 1B) discharges attenuated flows via an existing constructed detention pond to the existing drainage network on Station Road with eventual outfall to Sluice River/Baldoyle-Mayne Estuary. Upgrade works to the interim foul pumping station lie within this catchment.

The majority of the development lands lie within Catchment No.1 (37.55 Ha) including this proposed phase of development (Phase 1D) and future phases of development.

This catchment outfalls via an internal 'separated' surface water network to a regional constructed wetland and from there via 2no. 375mm dia. pipes complete with tideflex non return valves into the estuary.

The regional wetland, which was constructed as part of Phase 1B, has a minimum permanent water level depth of 300mm and was designed to cater for the entire catchment and provides both attenuation and pollutants removal through biological treatment and settlement. A settlement forebay has been provided to decrease velocity and sediment loading. The wetlands comply with the Storm Water Wetland Briefing Paper, GSDS.

Finally, Catchment No. 3 (0.98 Ha), which primarily serves flows arising from the proposed new 6.5m Access Road with 3m verge / reservation each side, will be attenuated and drain via 2no. proposed wetlands/SuDS devices with outfall flows limited to 2l/s each, prior to discharge through petrol interceptors to the existing ditches at two locations; 175m north of Moyne Road and an existing drainage ditch alongside Moyne Road and as noted earlier these ditches eventually connect to the Mayne River.

### 8.3.4 Flood Risk

A flood risk assessment has been carried out in accordance with ‘The Planning System and Flood Risk Management Guidelines’ (hereafter referred to as the FRM Guidelines) published in November 2009 jointly by the then Department of the Environment, Heritage and Local Government, DEHLG, (now the Department of the Environment, Community and Local Government, DECLG) and the Office of Public Works (OPW). This flood risk assessment is included with the SHD Planning Application documentation as a separate document.

Resources assessed in the above, include; local area reports, the Greater Dublin Strategic Drainage Study (2005), Dublin Coastal Flooding Protection Project (2005), Irish Coastal Protection Strategy Study (2013), Catchment Flood Risk Assessment and Management Study and finally the Strategic Flood Risk Assessment prepared as part of the Portmarnock South Local Area Plan (2013).

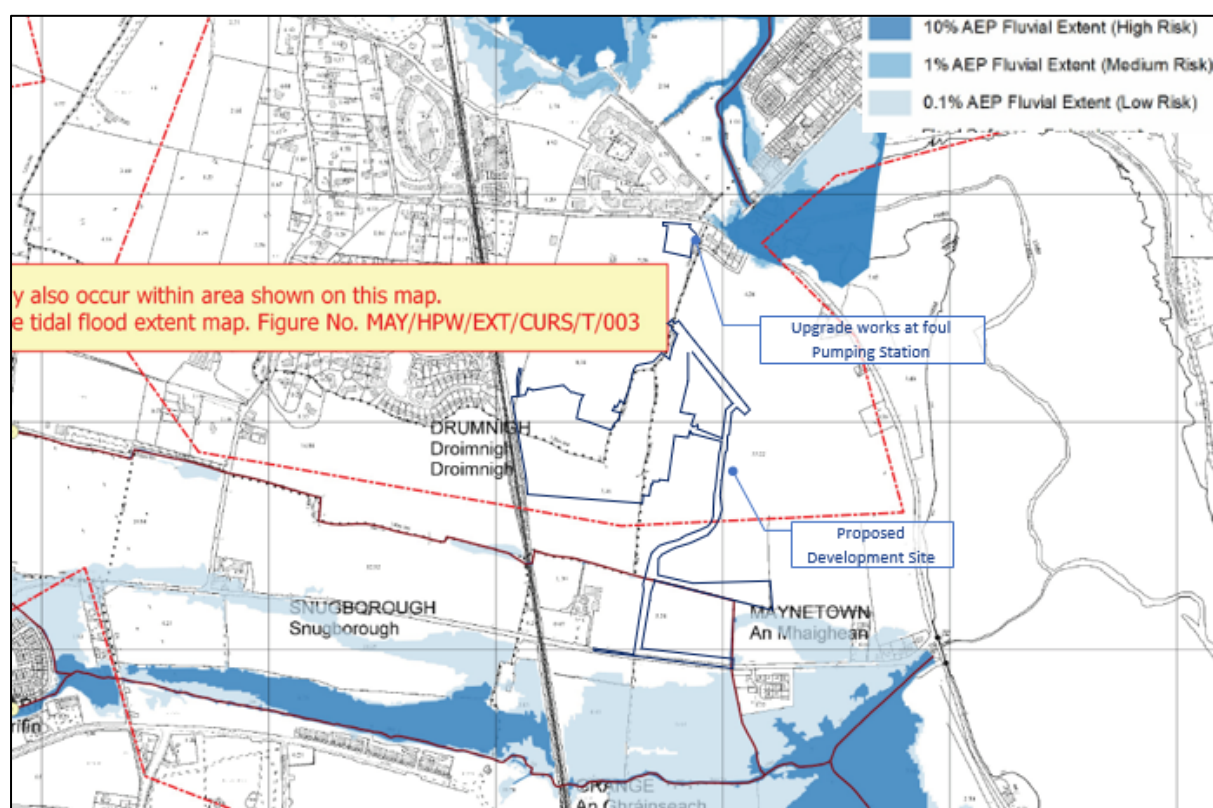
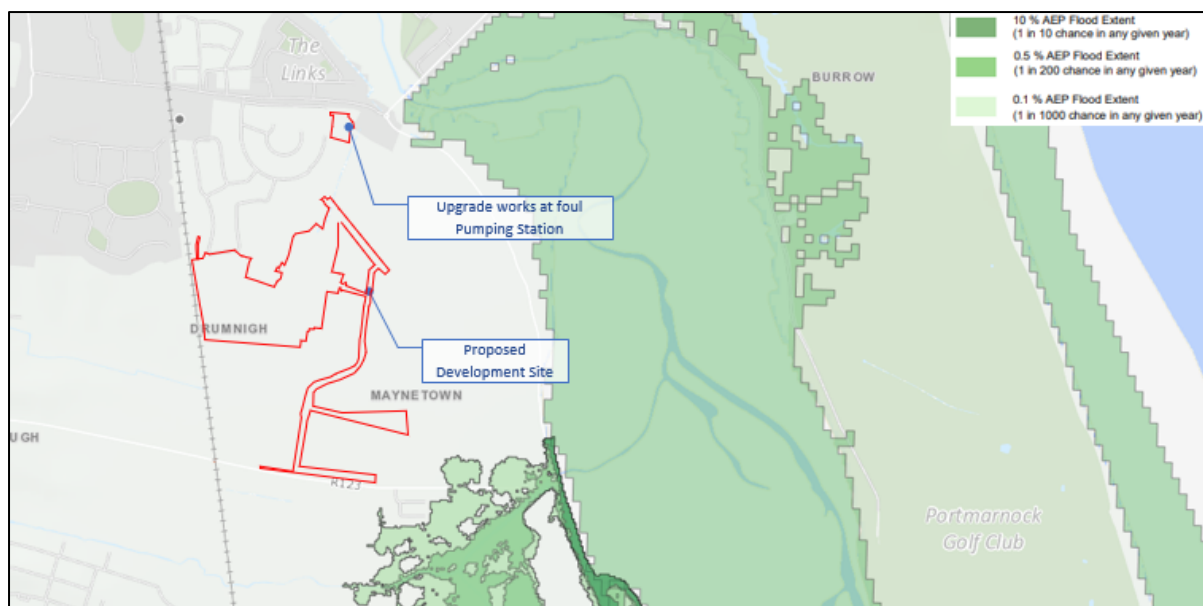


Figure 8.4: Extract from the FEMFRAMS Current Scenario Fluvial Flood Extent Map.



**Figure 8.5:** Extract from the FEMFRAMS Current Scenario Coastal Flood Extent Map.

As can be seen from the above maps, extracted from the relevant flood risk and management studies, the Proposed Development (including upgrade works to interim foul pumping station) and surrounding environs lie outside the 0.1% Annual Exceedance Probability for both fluvial and coastal events and thus are considered to be located in **Flood Zone C** i.e. the probability of flooding from rivers and the sea is low, less than 1 in 1000.

Nevertheless, the Strategic Flood Risk Assessment which accompanied the Portmarnock South Local Area Plan identified four areas within the LAP lands as at risk, since existing site levels were within 0.5m to 1.0m of the 0.1% Tidal Flood Level, namely: -

- The north-east corner of the LAP lands.
- Existing housing at Portmarnock Bridge.
- Proposed Irish Water foul pumping station site (then proposed within LAP).
- Existing housing at south-eastern corner of LAP lands.

And as consequence, it was recommended that the following measures form part of Proposed Development for these lands to mitigate the risk of flooding: -

- Set the building finished floor levels at an appropriate level above the appropriate predicted flood levels.
- Determine as part of the detailed design the impact of flooded outfalls/tide locking on the outfall from this area and mitigate against the same.
- Provide adequate overland flood routing away from this area, ensuring flood routing is directed away from properties and vulnerable infrastructure.

Although none of these areas identified fall within the Proposed Development or future phases, it is proposed to follow the above recommendations.

The lowest building finished floor level of previous phases is +5.0m above Malin Ordnance Datum.

### 8.3.5 Water Supply Infrastructure

Refer to Chapter 15: Material Assets (Utilities) for assessment on same.

### 8.3.6 Foul Drainage Infrastructure

The Portmarnock South Lands lie within the North Fringe Sewer catchment, which in turn discharges to the Ringsend Wastewater Treatment Plant.

This treatment plant is currently operating in excess of its 2005 design capacity of 1.64 million population equivalent having received an average daily wastewater load in 2019 of 1.98 million population equivalent. However, work commenced in February 2018 on the first part of a series of upgrades to this plant with the construction of an additional secondary treatment capacity of 0.4 million population equivalent which is due to be completed and commissioned this year.

The second element of the upgrade works (upgrade of 24 existing secondary treatment tanks) commenced in November 2020 and a contract has recently been signed for the third element i.e. the construction of a phosphorous recovery facility.

The Ringsend Wastewater Treatment Plant will have an increased capacity for a 2.1 million population equivalent in 2023 and ultimately when these proposed upgrade works are complete, a capacity of 2.4 million population equivalent in 2025 and achieve compliance with the Urban Wastewater Treatment Directive.

The greater Portmarnock foul network discharges to an existing pumping station located adjacent to Portmarnock Bridge and from there the effluent is pumped via a rising main along the Coast Road to a high point and then flows by gravity to the Mayne Bridge Pumping Station which in turn pumps to the North Fringe Sewer (1600mm diameter in this locale) located approximately 1km to the south and as noted earlier this then flows into the Sutton Pumping Station which pumps to the Ringsend Wastewater Treatment Plant.

Although originally envisaged by the Local Area Plan, that a new permanent pumping station would be constructed on the Portmarnock South Lands, which would service both the Proposed Development flows and replace the existing Portmarnock Bridge Pumping Station (nearing capacity and lacking storage, particularly during significant rainfall events), upon review by Irish Water, following their assumption of responsibility for foul and water infrastructure in 2014, they proposed to develop a new Portmarnock Bridge Pumping Station on lands adjacent to the existing pumping station as part of their Local Network Reinforcement Project strategy.

The proposed new Portmarnock Bridge Pumping Station will have twice the current capacity of the existing as well as storm water storage to substantially reduce the risk of emergency overflows during peak rainfall events and will discharge, via a 1.7km rising main, directly to the North Fringe Sewer i.e. bypassing the Mayne Bridge Pumping Station (and therefore reducing load on same).

Irish Water has re-lodged a planning application to Fingal County Council for this upgraded pumping station (with improved storage) and rising main to the North Fringe Sewer in July 2021, having previously been refused permission by An Bord Pleanála in December 2020 for not adequately addressing flood risk.

As part of earlier developments within the subject lands, a temporary pumping station (St. Marnock's Temporary Pumping Station), including storage was constructed adjacent to Station Road, which lifts the flows from these developments and discharges to the gravity sewer in Coast Road, which in turn outfalls directly (i.e. bypassing the at capacity existing Portmarnock Bridge Pumping Station) into the Mayne Bridge Pumping Station.

Ultimately this temporary pumping station will be de-commissioned and all foul flows from the subject lands will be re-directed by gravity to the proposed new Irish Water Portmarnock Bridge Pumping Station.

Also, of relevance to the Portmarnock South lands is the proposed Greater Dublin Drainage Project which seeks to construct a pumping station at Abbotstown, which will discharge to a proposed orbital sewer running from Blanchardstown to Clonsaugh, where a new regional wastewater treatment facility and sludge hub centre is proposed.

This regional treatment facility will also receive flows from a proposed sewer diverting part of the North Fringe Sewer (thereby reducing flows within same and eventual load on the Ringsend Wastewater Treatment Plant).



Finally, as part of this Greater Dublin Drainage Project, it is proposed to construct an outfall pipe from the Clonshaugh treatment facility, which will traverse the subject lands with eventual discharge 6km into the Irish Sea.

Planning permission was granted by An Bord Pleanála for the Clonshaugh treatment facility in November 2019, however following a recent court case, it is noted that the board's decision has been quashed, but that the matter is to be remitted to them from the point where the Inspector's report was submitted for their consideration.



Figure 8.6: Foul Drainage Infrastructure.

## 8.4 Characteristics of the Proposed Development

### 8.4.1 Proposed Development

The Proposed Development (Phase 1D), is described in detail in Chapter 3: Description of Proposed Development, but may be summarised as follows: -

- 172no. residential units consisting of 22no. duplexes and 150no. houses ranging in heights between 1.5 and 3 storeys.
- Provision of public open space including Skylark Park and extension to Railway Linear Park and Townland Boundary Linear Park.
- Vehicular access to serve the development is proposed off the existing / under construction access points on roads serving the St. Marnock's Bay development.

- A new vehicular road is proposed to serve the Proposed Development which will connect with Moyne Road. The permanent road includes the provision of a new junction with Moyne Road and SuDS features to control surface water run-off.
- Upgrade of existing temporary foul water pumping station and storage tank to increase capacity.
- All associated and ancillary site development, infrastructural, landscaping and boundary treatment works.

In the context of this assessment the key characteristics of this development are set out in the paragraphs below and further detailed in the Water Services Report (21205-JBB-00-XX-RP-C-00209\_Water\_Services\_Report\_P04) which accompanies this SHD Planning Application.

The Proposed Development and future development phases, subject to relevant planning permissions being granted, will be constructed along the following timeline: -

- Phase 1D – 172no. units – Commence construction Q2 2022.
- Phase 1E – 190no. units – Commence construction Q2 2023.
- Phase 1F – 317no. units – Commence construction Q1 / Q2 2024.

### **Surface Water Drainage**

The Proposed Development (as well as previous phases) has been designed in accordance with a sustainable drainage strategy (SuDS) and as such any surface water runoff will follow a surface water management train approach with the focus not only on controlling the quantity of discharge flows through attenuation, but on providing treatment storage to remove pollutants and thus improve the quality of water being discharged to the estuary.

The key component of this approach (and as noted earlier, has been constructed as part of Phase 1B) is the Regional Constructed Wetland, located adjacent to Coast Road, which provides for a permanent water volume of c. 3,000m<sup>3</sup>, with a minimum water level depth of 300mm, thus removing pollutants through biological treatment and settlement. A settlement forebay was incorporated as part of these wetlands to decrease flow velocities and increase settlement loading.

The surface water drainage infrastructure for the Proposed Development will discharge to this regional wetland and will be a 'separate' system, that is no surface water runoff will discharge to the foul drainage system, and vice versa.

Various SuDS devices will be utilised upstream within the Proposed Development itself (Swales, Permeable Pavement Parking Bays, Filter Drains, Filtration Trenches, Tree Pits, Petrol / Oil Interceptors) and storm water runoff from the development will pass through a minimum of three devices.

For clarity, the above source and site control measures are proposed for this phase (and any future phase) of the development in addition to the regional control wetland, already constructed under an earlier phase.

Surface Water discharge from the Regional Wetland is controlled and attenuated for the 1 year, 30 year and 100 year critical storm events with outflow rate limited to 200l/s for the entire Catchment 1 lands based on the Q<sub>100</sub> critical storm event.

Surface Water flows arising from the proposed permanent Moyne Access Road (Catchment 3) will be attenuated and drain via 2 No. proposed local wetlands/SuDS devices with outfall flows limited to 2l/s each, prior to discharge through petrol interceptors to the existing ditches at two locations; 175m north of Moyne Road and an existing drainage ditch alongside Moyne Road.



## Flood Risk

As noted earlier a flood risk assessment was carried out (refer to 21205-JBB-00-XX-RP-C-00208\_Flood\_Risk\_Assessment\_P02) which identified that the Proposed Development (and future phases) lies within Flood Zone C where the probability of flooding from rivers and the sea is low i.e. less than 1 in 1000. This assessment also noted that flooding from groundwater and/or pluvial events was not considered to be significant.

Therefore, the Proposed Development, although categorized as a ‘highly vulnerable development’ is appropriate for this location and does not require a justification test.

The Strategic Flood Risk Assessment which accompanied the Portmarnock South Local Area Plan recommended that the following measures form part of Proposed Development for these lands to mitigate the risk of flooding: -

- Set the building finished floor levels at an appropriate level above the appropriate predicted flood levels.
- Determine as part of the detailed design the impact of flooded outfalls/tide locking on the outfall from this area and mitigate against the same.
- Provide adequate overland flood routing away from this area, ensuring flood routing is directed away from properties and vulnerable infrastructure.

These recommendations have been incorporated into the Proposed Development as follows: -

- Building Finished Floor Levels for this phase range from **+8.75m** to **+14.9m** above ordnance datum (refer to drawings 21205-JBB-00-XX-DR-C-02003 to 02005 incl.) i.e. well above the 0.5% annual exceedance probability estimate for tidal flood levels of +3.2m above ordnance datum, plus allowances for mean sea rise (0.5m) and freeboard (0.5m).
- It is noted that the flood risk assessment followed the OPW guidelines in setting allowances for Mean Sea Level Rise of +500mm for a Mid-Range Future Scenario and together with a freeboard of 500mm set the minimum finished floor level as +4.2m above ordnance datum.

However, Fingal County Council (Opinion Report PPSHD/006/21) recommended applying a Mean Sea Level Rise of +1000mm for a High-End Future Scenario and a freeboard of 300mm. This approach gives rise to a minimum finished floor level of **+4.73m** above ordnance datum, and this constraint will be applied to this and all future phases of the development.

<b>Current Scenario 0.5% AEP Flood Level</b>	<b>MRFS Scenario 0.5% AEP Flood Level + 0.5m Freeboard</b>
+3.2m OD	+4.2m OD
<b>Current Scenario 0.1% AEP Flood Level</b>	<b>HEFS Scenario 0.1% AEP Flood Level + 0.3m Freeboard</b>
+3.43m OD	<b>+4.73m OD</b>

**Table 8.5:** Design Water & Floor Levels for the Proposed Development.

- The proposed Finished Floor Levels for this development are well in excess of the above minimum recommended finished floor level.
- Access covers to the upgraded interim foul pumping station’s storage tank and pumping chamber will also be set at a minimum of +4.73mOD.
- The drainage network was modelled for various flow conditions (1 year, 30 year and 100 year storm events) with free discharge or against a +3.7m OD tide level (tide lock scenario) and the results are listed in the table below. In summary although surcharging exists, no flooding occurs.

Critical Storm	Discharge Conditions	Top Water Level in Wetland (m OD)	Pipe Flow (l/s)	Velocity (m/s)
1 Year	Free Discharge	+3.19	130.20	0.60
1 Year	+3.70 Tide Level	+3.19	164.70	0.76
30 Years	Free Discharge	+3.56	169.50	0.78
30 Years	+3.70 Tide Level	+3.80	199.10	0.92
100 Years	Free Discharge	+3.69	182.90	0.85
100 Years	+3.70 Tide Level	+4.03	207.60	0.96

**Table 8.6:** Analysis /Results of Catchment 1 Modelling.

- The Regional Constructed Wetland caters for attenuation of all the lands which fall within Catchment No.1 and as shown above, does so without causing flooding of the residential developments (both existing and proposed), however as requested by Fingal County Council, drawings are included with the SHD Planning Application which show overland flow paths through the Proposed Development. Refer to drawing 21205-JBB-00-XX-DR-C-04014 to 04017.

### Water Supply Demand

Refer to Chapter 15: Material Assets (Utilities) for assessment on same.

### Foul Drainage

The proposed Phase 1D development will produce a daily flow of 76,712 l/day, estimated in accordance with Section 3.6 and Appendix C of Irish Water's Code of Practice for Wastewater Infrastructure (July 2020 – Rev 2) and a peak discharge rate of 5.34l/s.

The foul discharge from the Portmarnock 1D development will be collected in a proposed foul drainage network and connect via foul infrastructure, constructed under previous developments, to the temporary pumping station, described earlier, with eventual outfall via a 375mm dia. gravity main on the Coast Road to the Mayne Bridge Pumping Station, until such time as the proposed Irish Water Portmarnock Bridge Pumping Station is commissioned and flows are redirected.

From discussions with Irish Water, it was understood that there is residual capacity within the Mayne Bridge Pumping Station and associated infrastructure to cater for this development, which was confirmed following a pre-connection enquiry, by Irish Water in October 2019.

Notwithstanding the above and acknowledged no change in the nature of the application, the applicant was requested by Fingal County Council to obtain an updated Confirmation of Feasibility from Irish Water. Irish Water in turn requested a re-submission of the pre-connection enquiry as it was in excess of 12 months old, for their review to confirm that no significant changes have occurred to the Irish Water wastewater network in the last 18 months, which would influence the feasibility assessment. The pre-connection enquiry form was re-submitted in April 2021.

Irish Water's subsequent review of the existing infrastructure raised a concern that there may be insufficient capacity within the existing network on Coast Road / Mayne Bridge Pumping Station to receive increased flows when both the existing Irish Water Portmarnock Bridge Pumping Station and the temporary pumping station discharge simultaneously.

Meetings were held with both Fingal County Council Water Services Department and Irish Water and the following proposal was considered for this development, namely; the current temporary pumped discharge rate would be maintained for this Proposed Development phase, and any future phase thereafter, unless otherwise agreed, with the provision of additional operational storage in excess of that normally provided for emergencies (24-hour storage).

This additional operational storage (minimum 6 hours) together with telemetry and PLC upgrades (to allow the 3 pumping stations to communicate with one another) would facilitate the operational demand management of all three pumping stations i.e. Existing Portmarnock Bridge Pumping Station, Mayne Bridge Pumping Station and St. Marnocks Temporary Pumping Station and provide Irish Water with a managed system.

These telemetry and programmable logic control upgrades will, as needs arise, provide Irish Water with a managed system and allow for the St. Marnocks Temporary pumping station to be turned off or discharge at a reduced rate for a period of up to 6 hours, to facilitate instances where either increased discharges are required from the existing Portmarnock Bridge Pumping Station or where it is necessary to limit inflows to Mayne Bridge Pumping Station to allow pump and storage capacity to meet demand. The St. Marnocks Temporary Pumping Station would be re-engaged when circumstances allow, utilising off-peak periods to clear mobilized storage volumes.

Currently 227m<sup>3</sup> of storage is provided at the temporary pumping station, this will need to be increased to both provide for the cumulative 24-hour emergency storage for Phases 1A to 1D inclusive (576 units + Local Centre) of 258m<sup>3</sup> and additional operational (buffer) storage for Phases 1A to 1D of 65m<sup>3</sup>, giving a required minimum total storage of 323m<sup>3</sup>. This increased volume can be accommodated in the temporary pumping station location, as shown on drawings 21205-JBB-00-XX-DR-C-04019 to 04021 incl.

During these discussions and in light of the envisaged timeline for delivery of the new Irish Water Portmarnock Bridge Pumping Station (c. 2025), it was agreed that the St. Marnock's Temporary Pumping Station should be upgraded to reflect its interim status. These upgrades to include: -

- New pumping station wet well (to replace existing), benched to facilitate scour cycle.
- New welfare building - housing control panel and telemetry.
- New storage tank(s) to supplement existing tanks.
- Lifting gantry to facilitate pump maintenance.
- Wash down hose reel to facilitate maintenance.
- Valve chambers.
- Assisted lift access hatches.
- Outdoor lighting.
- Pump isolation cabinet.
- Area of hardstanding to facilitate access and maintenance operations.
- Provide/Upgrade telemetry.
- Install flowmeter and level sensors in storage tanks.
- Install pumping station interlock as well as intelligent pumping station controls.
- Fencing to enclose area to restrict unauthorised access.

For clarity the operational and maintenance of the St. Marnock's Interim Pumping Station remains with the developer, and a maintenance agreement will be entered into with a suitable company for same. This interim pumping station and associated storage will be decommissioned and removed at such time as the new Irish Water Portmarnock Bridge pumping station becomes operational. All flows from the Portmarnock South lands would then be redirected by gravity to the new Irish Water Portmarnock Bridge pumping station, as allowed for in the current design.

On this basis Irish Water issued an updated Confirmation of Feasibility (4 October 2021) noting the following in respect of their foul infrastructure; *Feasible subject to Upgrades* and specifically noting the following:-

*"The proposed interim solution to provide additional storage at the existing Temporary Pumping Station in St. Marnocks prior to the completion of the Portmarnock Local Network Reinforcement Project is acceptable in principle subject to the following: -*

- *24 Hr storage to be provided for all existing phases and 24 Hr storage is to be provided for the new phases of the development. The size to be determined from flow monitoring or design flows (whichever is larger).*
- *Full telemetry system to be provided in conjunction with Irish Water to link the St. Marnocks Temporary PS with Portmarnock Bridge PS and Mayne Bridge PS.*
- *Full Flow Monitoring to be provided and linked to the Telemetry System visible to Irish Water (including pump forward flows from the Temporary Pumping Station and overflows).*
- *Design of the interim solution to be delivered prior to Connection Agreement.*
- *The customer is responsible for the maintenance and operation of the Temporary Pumping Station.*
- *The Temporary Pumping Station is to be fully decommissioned by the customer on completion of the Portmarnock Local Network Reinforcement Project.”*

A detailed design was submitted to Irish Water (October 2021) for the purposes of obtaining a Statement of Design Acceptance and approval for same received 23 November 2021.

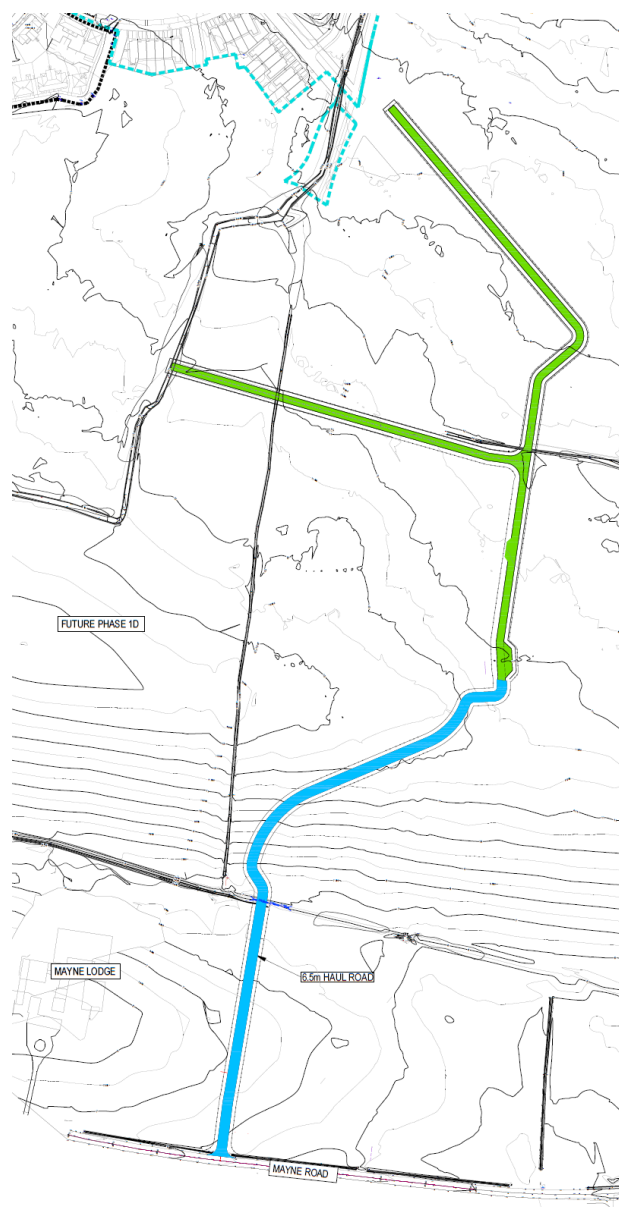
The foul drainage infrastructure will be a ‘separate’ system, that is no foul effluent will discharge to the surface water drainage system, and vice versa. This foul drainage network will be constructed in accordance with Irish Water, and where relevant Fingal County Council requirements, specifications and standard details.

#### 8.4.1.1 Construction Phase

As noted, this development is a residential development with building heights ranging from 1.5 to 3 storeys, therefore the key construction activities involved are: -

- Excavation for drainage and service infrastructure – depths vary but less than 4m.
- Excavation for strip footing foundations to residential units.
- Excavation for roads, parking and paths – typically depth to formation less than 1m.
- General excavation to facilitate final layout and level of proposed development, and although re-use of suitable material will be facilitated, it is estimated that nominally 24,000m<sup>3</sup> of material (incl. material excavated for drainage, services, foundations, roads, parking and paths) will be removed from site.
- Construction of new drainage and services infrastructure to facilitate the development.
- Construction of buildings (brickwork/blockwork/timber frames, precast concrete floors and frames, in-situ concrete footings, columns and beams where required, render finishes).
- Construction of boundary walls and fencing.
- Placing of fill to achieve required levels.
- Construction of roads, parking and footpaths.
- Landscaping.
- Imported fill, stone, aggregates are required to complete the development, and this is estimated at 20,200m<sup>3</sup>.

The existing construction compound used for the current phase of the development (Phase 1C) will be retained and used for the construction of the Proposed Development also.



**Figure 8.7:** Construction Access (Green: Lands within Applicants control, Blue: Lands within FCC control).

Currently, construction access to and from the site is via a dedicated access off Station Road to the east of the Phase 1B access and to the west of the Portmarnock Bridge / Coast Road Junction.

In order to construct the current permitted development (Phase 1C), permission was sought and granted (FCC Reg. Ref. F20A/0700) to construct a Haul Road from the development lands heading south to connect into Moyne Road, which in turn will mitigate public safety issues and traffic congestion on Station Road for both the current development phase and future phases. This Haul Road will be operational in December 2021 and will subsequently be used for the construction of the Proposed Development (Phase 1D).

All works will be constructed in accordance with a Construction and Environmental Management Plan (CEMP), specifically prepared for this phase of the development.

All connections to foul drainage and water supplies will be in accordance with Irish Water's relevant Code of Practice for same.

#### 8.4.1.2 Operational Phase

On completion of the Construction Phase, the development becomes a residential estate.

There are no specific operational elements for consideration other than surface water drainage, foul drainage and water supply to function as designed, which in turn requires maintenance in accordance with acknowledged standards for same i.e.: -

- Cleaning of gullies.
- Inspection of drainage lines at suitable intervals.
- Monitoring and cleaning of petrol interceptors at planned intervals.
- Monitoring and maintenance of interim foul pumping station until such time as it is decommissioned.
- Inspection and maintenance of SuDS features as per the requirements of the SuDS Manual, CIRIA 753, 2015 and Section 3.6 of Fingal County Council's Green/Blue Infrastructure for Developments Guidance Note.
- Periodic testing of water supply.

#### 8.4.2 Cumulative

As noted earlier the cumulative development (for assessment purposes) consists of the current phase under construction (Phase 1C) and the development of future phases to build out approximately 507no. residential units including public open space, integration of recorded monument and provision of road and drainage infrastructure.

The nature of these developments will be similar in character to the Proposed Development Phase 1D.

Additional foul storage may be required adjacent to the Interim Pumping Station, the required size will be determined from flow monitoring or design flows (whichever is the larger). It is noted there exists sufficient space to cater for envisaged storage requirements at the current location.

##### 8.4.2.1 Construction Phase

The construction methodology for the current and future phases will be similar to that described above, with excavation depths of a similar order and cut fill volumes pro-rata to the house numbers being constructed under each future phase.

It is noted that the construction compound and marketing suite will be relocated to facilitate future development phases but will always remain within the overall development lands and be proximate to those phases.

The Haul Road will eventually be superseded by the permanent access road to Moyne Road, to be constructed as part of this phase of the Proposed Development, which will serve the same function in the context of construction traffic i.e. mitigate public safety issues and traffic congestion on Station Road.

##### 8.4.2.2 Operational Phase

As before on completion of the Construction Phase for each phase of the development, then that phase of the development becomes a residential estate.

The maintenance and inspection elements described earlier will also apply for each consecutive phase of the development.

## 8.5 Potential Impact of the Proposed Development

### 8.5.1 Proposed Development

#### 8.5.1.1 Construction Phase

The following potential impacts arising from construction of the Proposed Development have been identified: -

- **Increase in Sediment Concentration**

Bulk excavation, material stockpiling and specific excavation for drains, services and foundations, if not properly managed can lead to increased sediment concentration in surface water runoff which may in turn flow via existing drains, ditches or overland and outfall into nearby waterbodies.

There are three work locations to assess here, namely; main development, access road to Moyne Road and works to foul pumping station.

The magnitude of impact is assessed to be negligible for the main development, since the majority of the proposed works are approx. 600m to 700m away from nearby waterbodies and slopes are relatively flat (1:20 to 1:50) for the ditch / overland pathways. Also, the Regional Wetland is constructed so that flows via network pathway will outfall to same before discharging to estuary.

The magnitude of impact is assessed to be small adverse for the access road to Moyne Road, since whilst the works are some distance from the Mayne River, there is a pathway via both ditches to same and the road will require culverting where it passes over the northern ditch. The drainage from this road will, as noted earlier, pass through two wetlands/SuDS devices with outfall flows limited to 2l/s each, prior to discharge through petrol interceptors to the existing ditches at two locations, however since these are not currently constructed this elevates slightly the risk of potential sediment concentration in advance of same, hence *small adverse* assessment.

Finally, the magnitude of impact is assessed to be small adverse for the upgrade works to the interim pumping station, since whilst these works are closer to the Sluice River (c. 130m), there is a detention pond (installed previously as part of Phase 1B of this development) prior to discharge to surface water infrastructure and the works themselves are focussed in nature.

- **Accidental Spills and / or Leaks**

Spills arising from leakage of oils, fuels and chemicals stored on site or oils and fuels from construction plant working on site. These spillages may directly flow into the surface water drainage network or be conveyed there in runoff and from there to nearby waterbodies. The magnitude of impact is assessed to be negligible given scale of activities involved and the pathway limitations as described above.

- **Spillages Arising from Concreting Operations**

Any runoff from concreting operations has the potential for a highly alkaline leachate to enter drains if not properly managed and therefore be conveyed into nearby waterbodies. The magnitude of impact is assessed to be negligible given limited amount of concrete works involved and the pathway limitations as described above.

Source	Path	Potential Receptor	Significance
Earthworks	Combined with Runoff – drain network, ditches, overland	Baldoyle / Mayne Estuary, Mayne River Sluice River	Imperceptible
			Slight
			Slight
Oils, Fuels, Chemicals	Direct to or combined with Runoff – drain network, ditches, overland	Baldoyle / Mayne Estuary, Mayne River Sluice River	Imperceptible
			Imperceptible
			Imperceptible
Concreting Operations	Combined with Runoff – drain network, ditches	Baldoyle / Mayne Estuary, Mayne River Sluice River	Imperceptible
			Imperceptible
			Imperceptible

**Table 8.7:** Significance of Potential Impacts of the Proposed Development – Construction Phase prior to Mitigation.

It is important to reiterate that the Regional Wetland is already constructed as part of an earlier phase and as such intercepts and treats all surface water flows from this Proposed Development, even during the Construction Phase, prior to eventual outflow to the Baldoyle / Mayne Estuary.

#### 8.5.1.2 Operational Phase

The following potential impacts arising post completion of the Proposed Development have been identified: -

- **Flooding**

The flood risk assessment identified that the Proposed Development lies within Flood Zone C and as such is at a low risk of flooding, furthermore finished floor levels are being set at a level greater than that suggested by a Mean Sea Level Rise of 1m as suggested by a High-End Future Scenario and appropriate freeboard.

Furthermore, the development lands (neither earlier, current nor future phases) are within a flood plain, thus there is no increase in flood risk to the surrounding area as a consequence of this development.

Similarly, the proposed upgrade works to the interim foul pumping station lie within Flood Zone C and as such are at a low risk of flooding, nevertheless ground levels at access covers to storage tanks and pumping chamber will be set as above, namely, set at a level greater than that suggested by a Mean Sea Level Rise of 1m as suggested by a High-End Future Scenario and an appropriate freeboard.

There is no loss of or depletion to existing floodplain cross sectional area, or storage as a result of this development and any surface water generated as result of increase in hardstanding is being managed using SuDS principles (mitigation by design), therefore the impact is assessed as negligible.

- **Accidental Spills and / or Leaks**

Spills arising from leakage of oils and fuels from occupant's vehicles in car parking bays. These spillages may directly flow into the surface water drainage network and from there to nearby waterbodies. The magnitude of impact is assessed to be negligible given scale of activities involved, source controls including petrol interceptors installed on network and the Regional Wetland is constructed so that flows via network pathway will outfall to same before discharging to estuary.



- **Emergency Foul Overflows**

It is noted that Irish Water has submitted a planning application for a new pumping station at Portmarnock Bridge, which will have twice the capacity of the existing pumping station as well as increased storm water storage to substantially reduce the risk of emergency overflows to the Sluice River during storms.

The existing temporary foul pumping station, which will be upgraded to interim status (St. Marnocks Interim Pumping Station) as part of this Proposed Development, is not susceptible to surface water inflows and has storage capacity to cater for the current constructed and under Construction Phase of this development.

This pumping station will provide additional storage for both 24 hour emergency storage for the Proposed Development as well as a minimum 6 hour additional operational storage, which together with telemetry and PLC upgrades will provide Irish Water with a managed system. The peak discharge from this interim pumping station will remain as it currently is.

As noted earlier, the telemetry and programmable logic control upgrades will, as needs arise, provide Irish Water with a managed system and allow for the interim pumping station to be turned off, or discharge at a reduced rate for a period of up to 6 hours, to facilitate instances where either increased discharges are required from the existing Portmarnock Bridge Pumping Station or where it is necessary to limit inflows to Mayne Bridge Pumping Station to allow pump and storage capacity to meet demand. The St. Marnocks Interim Pumping Station would be re-engaged when circumstances allow, utilising off-peak periods to clear mobilized storage volumes.

As a consequence, there will be no increase in the potential risk of foul overflows due to this development, since it is downstream of the existing Portmarnock Bridge Pumping Station, and the provision of additional storage as well as telemetry will facilitate Irish Water's control and management of all three pumping stations during peak events.

Finally receipt of the confirmation of feasibility from Irish Water indicates downstream infrastructure beyond the local pumping network also has the capacity to cater for this development.

Therefore, magnitude of the impact is assessed to be negligible.

Source	Path	Potential Receptor	Significance
Flooding	Combined with flood waters – drain network, ditches, overland	Baldoyle/Mayne Estuary,	Imperceptible
		Sluice River/Mayne River	Imperceptible
		Development Vulnerability	Imperceptible
Oils and Fuels	Direct to or combined with Runoff – drainage network.	Baldoyle/Mayne Estuary,	Imperceptible
		Mayne River	Imperceptible
Emergency Foul Overflows	Combined with Surface Water – drain network, ditches, overland	Baldoyle/Mayne Estuary,	Imperceptible
		Mayne River	Imperceptible
		Sluice River	Imperceptible

**Table 8.8:** Significance of Potential Impacts of the Proposed Development – Operational Phase.

### 8.5.1.3 Do Nothing Impact

In the event that the Proposed Development does not proceed, then the site will remain in its current greenfield state and as a consequence there will be no potential for any significant impact on surrounding waterbodies.

## 8.5.2 Cumulative

The potential impacts for both the Construction Phase and the Operational Phase of the Proposed Development, equally apply for future phases, and whilst it is envisaged that the proposed Irish Water Portmarnock Bridge Pumping Station with rising main direct to North Fringe Sewer will be operational within their likely development timelines, however the proposed upgrades to the interim foul pumping station serving this and future developments, will enable it to continue to function until such time as this is the case.

## 8.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

### 8.6.1 Proposed Development

#### 8.6.1.1 Construction Phase

The appointed contractor to carry out the construction work for this development, will be required to prepare a site-specific CEMP which will include the following measures to minimize or reduce the risk of pollution events occurring;

- Within the works, temporary earth bunds/silt fences will be constructed to contain surface water run-off and channel it to a silt trap or settlement pond before discharge to the drainage network.
- Any excavated soil is to be temporarily stockpiled at least 20m from any ditch or drainage network or other waterbodies in order to reduce the likelihood of any suspended solids reaching them.
- Excavation and stockpiling works to be curtailed during sustained wet weather periods.
- SuDS features forming part of the development and in particular those for the proposed access road to Moyne Road, will be constructed early in the works programme.
- Ditch Culvert and Headwalls for Mayne Access Road to be Precast Concrete.
- Designated impermeable fuelling areas will be constructed. All oils and fuels will be stored in bunded tanks with the provision of a storage/retention capacity of 110% of tank storage.
- Pouring of cement-based materials for works will only be carried out in dry conditions.
- Care and attention to be taken during refuelling and maintenance operations. Drip trays and spill kits to be available on site.
- Chemicals to be stored in dedicated, secure bunded storage.
- Discharge points to the drainage network will entail a mechanism for containment of runoff in the event of accidental spillage, to enable clean-up and appropriate disposal through licensed facilities.
- Contractor Guidance set out in the Control of Water Pollution from Construction Sites (CIRIA, 2001) shall be adhered to.
- Environmental Good Practice on Site (CIRIA 2005) to be implemented and followed.
- Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996 – 2011.

Refer to CEMP prepared for this SHD Planning Application for further detail.

With the introduction of these mitigation measures, the significance of the potential construction impacts, identified earlier, are considered to reduce since they either remove the source of potential impact and / or place barriers to the pathways for such impact events.

### 8.6.1.2 Operational Phase

The following measures are incorporated in the design of the Proposed Development, which when implemented will mitigate any potential impacts currently identified: -

- The drainage design follows a sustainable drainage strategy (SuDS) i.e. mitigation by design, and as such any surface water runoff will follow a surface water management train approach with the focus not only on controlling the quantity of discharge flows through attenuation, but on providing treatment storage to remove pollutants and thus improve quality of water being discharged to the estuary. The key component of this approach is the Regional Wetland which is already constructed.
- Various SuDS devices will be utilised upstream within the Proposed Development (Swales, Permeable Pavement Parking Bays, Filter Strips, Filter Drains, Tree Pits, Petrol/Oil Interceptors) and storm water runoff from the development will pass through a minimum of three devices.
- Floor levels will be significantly greater than +4.73mOD.
- The interim foul pumping station will have a maintenance agreement in place until such time as it is decommissioned.
- Foul pumping station flows will be recorded to ensure in line with Irish Water agreements.

With the introduction of these mitigation measures, the significance of the potential operational impacts identified earlier are considered to reduce since they either remove / minimise the source of potential impact and / or place barriers to the pathways for such impact events.

### 8.6.2 Cumulative

The proposed mitigation measures for this phase of the Proposed Development equally apply to current and future phases and will have the same reduction in the significance of the potential impacts.

Again, it is envisaged that the proposed Irish Water Portmarnock Bridge Pumping Station with rising main direct to North Fringe Sewer will be operational within their likely development timelines, however the proposed upgrades to the interim foul pumping station serving this and future developments, will enable it to continue to function until such time as this is the case.

## 8.7 Residual Impact of the Proposed Development

### 8.7.1 Proposed Development

#### 8.7.1.1 Construction Phase

With the introduction of the proposed mitigation measures, the significance of the potential impacts are considered to reduce as follows: -

Source	Path	Potential Receptor	Significance
Earthworks	Combined with Runoff – drain network, ditches, overland	Baldoyle / Mayne Estuary, Mayne River Sluice River	Imperceptible
			Imperceptible
			Imperceptible
Oils, Fuels, Chemicals	Direct to or combined with Runoff – drain network, ditches, overland	Baldoyle / Mayne Estuary, Mayne River Sluice River	Imperceptible
			Imperceptible
			Imperceptible
Concreting Operations	Combined with Runoff – drain network, ditches	Baldoyle / Mayne Estuary, Mayne River Sluice River	Imperceptible
			Imperceptible
			Imperceptible

**Table 8.9:** Significance of Potential Impacts of the Proposed Development – Construction Phase with Mitigation.

The predicted overall residual impact of the Proposed Development on hydrology during Construction Phase will be imperceptible.

#### 8.7.1.2 Operational Phase

With the incorporation of the proposed design features and mitigation measures, the significance of the potential impacts are considered to reduce as follows: -

Source	Path	Potential Receptor	Significance
Flooding	Combined with flood waters – drain network, ditches, overland	Baldoyle/Mayne Estuary, Sluice River/Mayne River Development Vulnerability	Imperceptible
			Imperceptible
			Imperceptible
Oils and Fuels	Direct to or combined with Runoff – drainage network.	Baldoyle/Mayne Estuary, Mayne River	Imperceptible
			Imperceptible
Emergency Foul Overflows	Combined with Surface Water – drain network, ditches, overland	Baldoyle/Mayne Estuary, Mayne River Sluice River	Imperceptible
			Imperceptible
			Imperceptible

**Table 8.10:** Significance of Potential Impacts of the Proposed Development – Operational Phase with Mitigation.

The predicted overall residual impact of the Proposed Development on hydrology during the Operational Phase will be imperceptible.

#### 8.7.2 Cumulative

The predicted overall residual impact of the proposed cumulative development on hydrology during the Construction and Operational Phases will be imperceptible.

## **8.8 Monitoring**

### **8.8.1 Proposed Development**

#### **8.8.1.1 Construction Phase**

Regular inspections of the works and audits of the CEMP to determine mitigation measures are both adequate and being implemented.

#### **8.8.1.2 Operational Phase**

No specific monitoring proposed, other than to note maintenance regime to be implemented.

Monitoring and maintenance of interim foul pumping station until such time as it is decommissioned.

Monitoring of interim foul pumping station flows to ensure in line with Irish Water agreements.

### **8.8.2 Cumulative**

Monitoring to continue for future phases as per this proposed phase.

## **8.9 Reinstatement**

Not relevant.

## **8.10 Difficulties Encountered**

No difficulties were encountered during the preparation of this chapter of the EIAR.