7.0 HYDROLOGY

AWN Consulting has prepared this chapter of the EIAR which assesses and evaluates the potential impacts on the surrounding water & hydrological environment. In assessing likely potential and predicted impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

A Stage 2 Appropriate Assessment has been undertaken and a Natura Impact Statement accompanies this application which details proposed mitigation measures relating to potential adverse impacts on the Natura Network as a result of the proposed development, including surface water drainage

7.1 Study Methodology

7.1.1 Appraisals Methodology

The appraisal methodology for the EIAR is completed in accordance with *'Draft Guidelines on the Information to be contained in Environmental Impact Statements'* (EPA, 2017) and EPA Draft '*Advice Notes for preparing Environmental Impact Statements'* (2015). In addition, '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*' by the National Roads Authority (NRA, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental impacts on the hydrological environment is based on the quality, significance, duration and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that cited attribute. The EIAR guideline tables (EPA, 2017) are presented in Appendix 6.1. The NRA criteria for rating the magnitude and significance of impacts at EIA stage on the geological related attributes are also relevant in determining impact assessment and are presented in Appendix 7.1.

7.1.2 Sources of Information

This assessment was considered in the context of the available baseline information, potential impacts, consultations with statutory bodies and other parties, and other available relevant information. In collating this information, the following sources of information and references were consulted:

- Latest EPA *Maps & Envision* water quality monitoring data for watercourses in the area;
- Eastern River Basin District (ERBD) Management Plan – Boyne Estuary Water Management Unit and Programme of Measures – ERBD;
- National River Basin Management Plan 2018-2021
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Flood points & Historical Floods – Office of Public Works (OPW) floods website www.floodmaps.ie
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports

- Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites (Eastern Regional Fisheries Board (ERFB)
- Dublin City Council (2005) Greater Dublin Strategic Drainage Study (GDSDS): Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;
- Greater Dublin Regional Code of Practice for Drainage Works: Version Draft 6.0 (Wicklow County Council, South Dublin County Council, Meath County Council, Kildare County Council, Fingal County Council, Dún Laoghaire- Rathdown County Council & Dublin City Council);
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001);

Other relevant documentation consulted as part of this assessment included the following:

- IGSL Ltd. Site Investigation Report for Waterman Moylan Engineers July 2018
- Flood Risk Assessment for Proposed Residential Development at Marsh Road, Newton, Drogheda, Co. Louth, Waterman Moylan Consulting Engineers Ltd, June 2018, and;
- Engineering Assessment Report for Proposed Residential Development at Marsh Road, Newton, Drogheda, Co. Louth, Waterman Moylan Consulting Engineers Ltd, June 2018.

7.2 Receiving Environment

The subject site is bounded by the Dublin Belfast Railway line which runs along the southern boundary of the site, the Drogheda Waste Water Treatment Plant to the east, and greenfield lands to the north and west. Figure 7.1 presents the topographic nature and surface water features of the site and surrounding area.

Figure 7.1 Local Surface Water Environment (EPA, 2019)

7.2.1 Hydrology (Surface Water)

The River Boyne estuary is located c. 540m to the north of the proposed site with the Stagrennan Stream located c. 1.1 km to the south and flows easterly before entering the Boyne Estuary 2 km to the north east. The River Boyne and River Blackwater drain most of County Meath. They are important salmonid rivers and are home to a range of aquatic and riparian species. The proposed site is not within the catchment of any significant river. Smaller water course in this area join the river Boyne to the north. There is one small drainage ditch to the south of the proposed site identified in Chapter 5 *Biodiversity*. This ditch is to be infilled during construction. As per the Chapter 5 the drainage ditch is unlikely to support significant fish life and is unsuitable for migratory salmonid species (Atlantic Salmon Trout) or species of high conservation value (Eel, Lamprey etc.).

7.2.2 Surface Water Quality

The European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD).

The WFD requires *'Good Water Status'* for all European waters by 2015, to be achieved through a system of river basin management planning and extensive monitoring. 'Good status' means both *'Good Ecological Status'* and *'Good Chemical Status'.* In the 2nd cycle River Basin Management Plan published in April 2018 which replacing the 1st cycle river management plans (2009 – 2015)., the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g. water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD and include a programme of measures to address and alleviate these pressures.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010);

Figure 7.2 below presents the EPA surface water quality monitoring points in the context of the site and other regional drainage setting, as well as the waterbodies risk of not achieving good status. Here we can see the Boyne (a transitional/estuarine water body) has either not achieved its objective by 2015 or had achieved their objective but trend data indicates that its quality is deteriorating, and that further action is required. The Stagrennan stream is currently "In Review" meaning there is insufficient information to determine the risk , or to have had measures implemented but some additional monitoring is required to confirm expected improvements have been achieved.

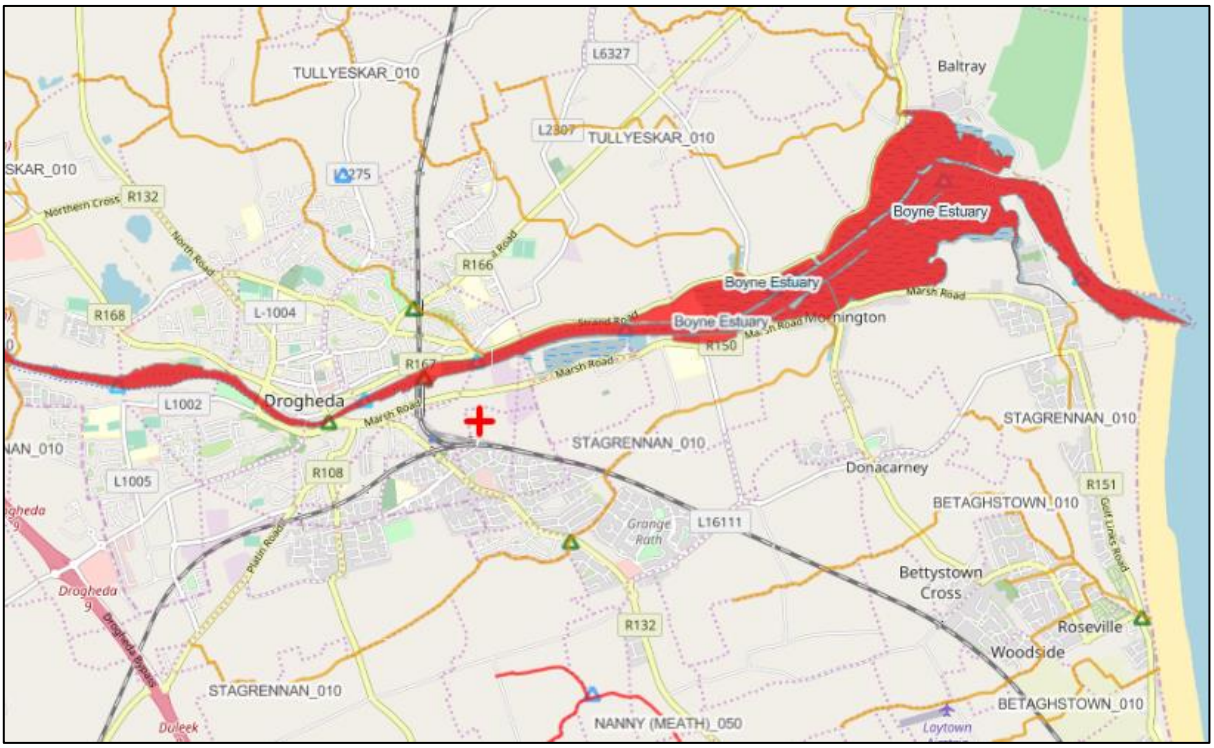

Figure 7.2 River/Transitional Waterbodies WFD Risk (EPA, 2019)

There are no EPA quality monitoring points along the Stagrennan Stream (only observational). The estuary of the Boyne was assessed as of 'intermediate' water quality and 'moderate' for the most recent WFD monitoring period (2010-2015).

7.2.3 Flood Risk

A Food Risk Assessment has been prepared by Waterman Moylan Engineers. This Flood Risk Assessment has been carried out in accordance with the *DEHLG/OPW Guidelines on the Planning Process and Flood Risk Management* published in November 2009. The assessment identifies and sets out possible mitigation measures against potential risks of flooding from various sources. Sources of possible flooding include coastal, fluvial (river), pluvial (direct heavy rain) and groundwater.

The Office of Public Works Flood Mapping (CFRAM Mapping) shows that the proposed development site has an extremely low risk of flooding from both fluvial and costal events. Figure 7.3 (CFRAM Map EO7DRO_EXFCD_10) shows the site lies outside (above) the 1 in 1000-year flood event. Following the OPW Flood Risk Management Guidelines the site is located in Flood Zone C – where the probability of flooding from rivers and sea is low (less than 1 in 1000 or less than 0.1%).

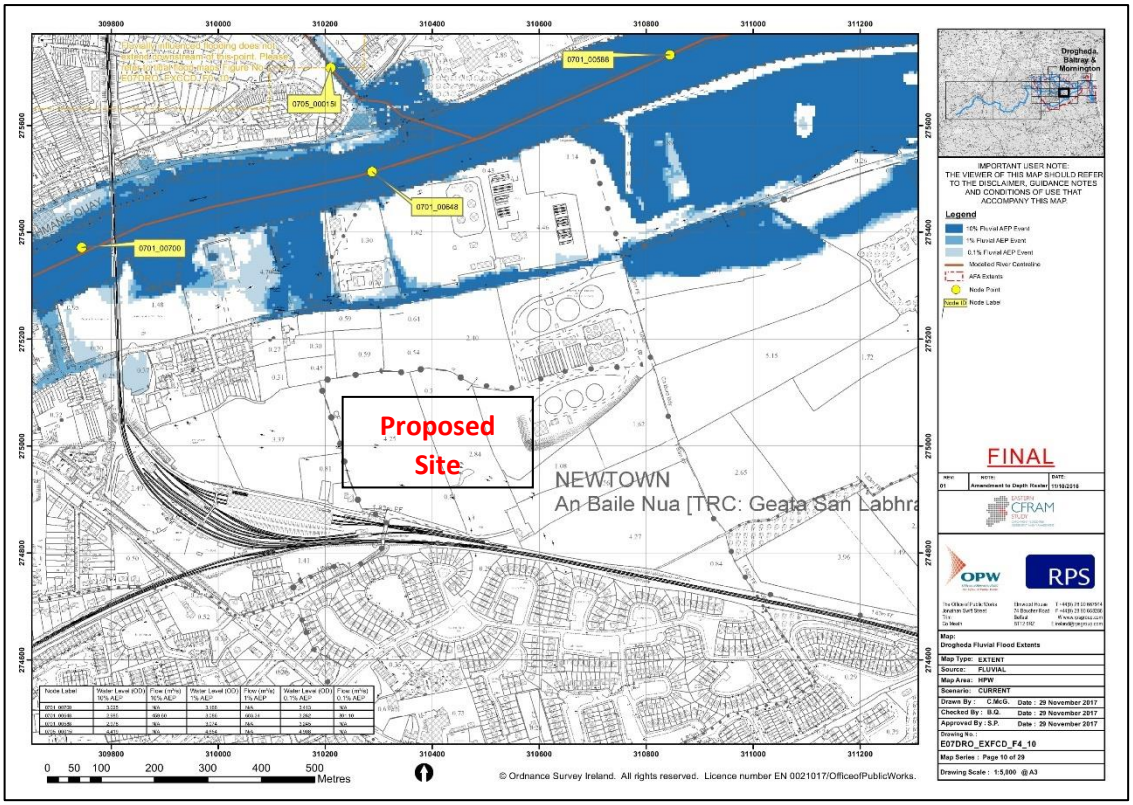

Figure 7.3 *Regional Fluvial Flooding Map* (OPW, 2017)

Likewise, the coastal flooding map (CFRAM Map E07DRO_EXCCD_F4_10) shows the site outside the area of influence of a 1 in 1000-year tidal flood event.

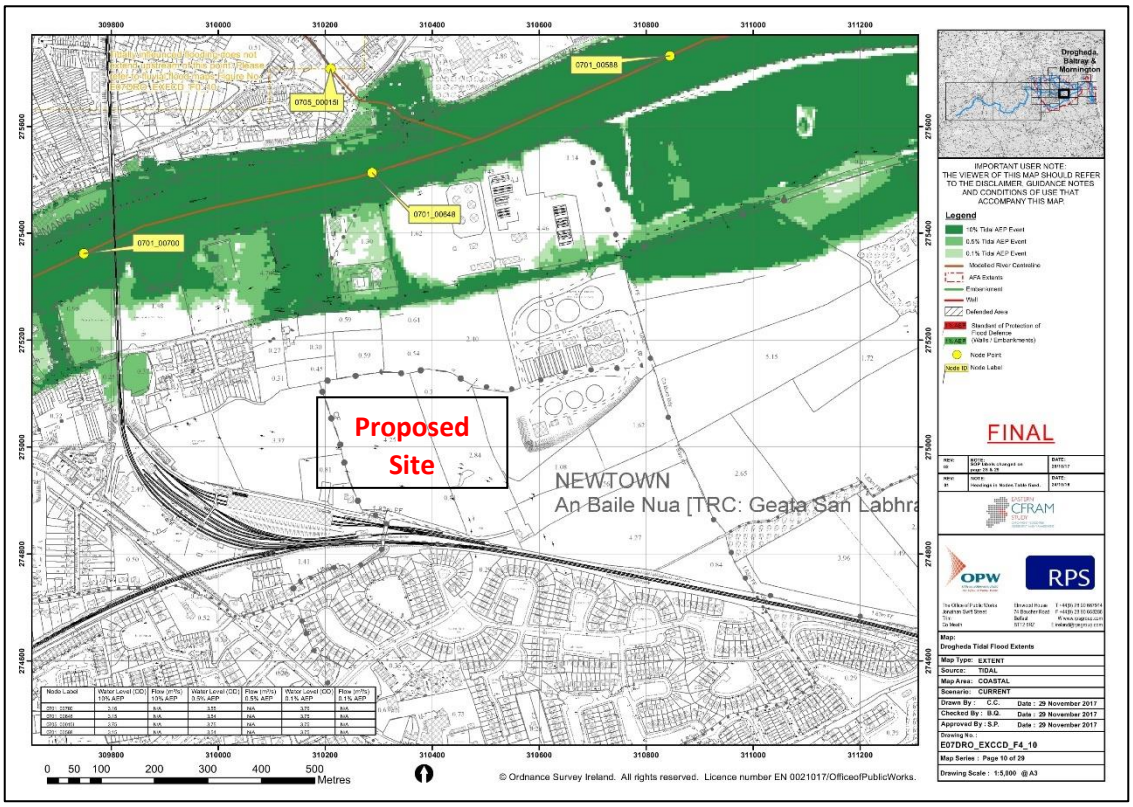

Figure 7.4 *Regional Costal Flooding* (OPW, 2017)

The risk from groundwater flooding is also believed to be low due to the lack of shallow groundwater within the overburden (see Chapter 6). Nevertheless, a robust drainage design in line with SuDS is to be employed ,the FRA states;

To alleviate this risk all services ducts and voids in the basement walls will have to be properly sealed to prevent the ingress of groundwater into the basement. The basement will be tanked to prevent ingress of water through the structure. A drainage system will be installed to collect water in the basement, which will be pumped to the public foul sewer. Finished floor levels have been set above the road levels and surrounding garden levels to insure any seepage of ground water onto the development does not flood into the residential units.

See the Flood Risk Assessment included as a separate document for more information.

7.2.4 Area of Conservation

The lands in which the proposed development is located have no formal designations. The nearest designated sites to the proposed development are the River Boyne and River Blackwater SAC (Site Code 002299) at c. 550m to the north site and the Boyne Coast and Estuary SAC (Site Code 001957) c. 2km to the northeast. The Boyne Estuary SPA is c. 480m to the north east. It is possible that the small drainage ditch onsite drains into the Stagrennan Stream which joins the River Boyne Estuary 2km downstream of the proposed site therefore it is possible that the site is hydraulically linked to the Boyne Estuary. Please refer to Chapter 5, the Appropriate Assessment Screening and Natura Impact Statement which accompanies this application under separate cover.

7.2.5 Rating of Site Importance of the Hydrological Feature

Based on the NRA methodology (refer to Appendix 7.1), for the criteria for rating the importance of hydrological features, the features at this site are rated as ***Medium Importance***. This is based on the fact that the Stagrennan Stream is not used locally as an amenity site both it and the Boyne Estuary do not supply potable water to homes falling within the criteria of "*Local potable water source supplying <50 homes Quality Class D.* It is possible that the site is hydrologically linked to the Boyne Estuary SPA, 2 km down river, due to the presence of a small drainage ditch which may drain to the Stagrennan Stream and onward to the Boyne Estuary. For this reason, a Stage 2 Appropriate Assessment has been undertaken and a Natura Impact Statement accompanies this application under separate cover. There are no sensitive fisheries habitats downstream as the River Boyne in this location is tidal in nature.

7.3 Characteristics of the Proposed Development

The proposed development consists of 450 No. residential Units, supporting neighbourhood and employment uses, a crèche, and all associated infrastructure necessary to service them. The office and crèche block include the provision of a three-level basement car park. A full description of development can be found in Chapter 3.

Construction activities with a possible impact to surface water features will include the following:

- Excavation of soil for levelling and Infilling and landscaping will be undertaken.
- Temporary storage/use of fuel/oils on site will be required for construction machinery.
- Infilling of the drainage ditch to the south of the proposed site.

Operational Activities will include the following:

- The total hardstanding area will be increased. It is expected that the surface water will be discharged to the public surface water network following attenuation to greenfield run-off rate and discharged through a hydrocarbon interceptor. The attenuation system (underground) has a capacity of 2,485m3 and a hydrobrake system will be employed to manage the outflow.

7.4 Potential Impacts of the Development

An analysis of the potential impacts of the proposed development on the hydrological environment during the construction and operation is outlined below. Due to the inter-relationship between surface water (hydrology) and soils, geology and hydrogeology the following impacts discussed will be considered applicable to both chapter 6 and 7 of the EIAR. Ecology (Biodiversity) and Waste Management is also considered an interaction.

7.4.1 Construction Phase

Increased Runoff & Sediment Loading

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

Contamination of Local water courses

During the construction phase, there is a risk of accidental pollution incidences from the following sources:

- spillage or leakage of oils and fuels stored on site or refuelling on site;
- spillage or leakage of oils and fuels from construction machinery or site vehicles; and
- the use of wet concrete and cement.

Machinery on site during the construction phase may result in contamination of the surface water. The potential impacts could derive from accidental spillage of fuels, oils, paints and solvents, which could impact surface water and groundwater quality if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses.

Concrete operations carried out near surface water bodies during construction activities could lead to a discharge of wastewaters to a watercourse. Concrete (specifically, the cement component) is highly alkaline and any spillage to a local watercourse would be detrimental to water quality and local fauna and flora.

Removal of Surface Water Drainage Features

There is one small drainage ditch to the south of the proposed site identified in Chapter 5. This is to be infilled during construction .

7.4.2 Assessment of Impact Pre-Mitigation – Construction

Based on the points stated above in relation to the construction phase the potential impact on the hydrological environment during construction (EPA 2017) is considered to have a short term – slight effect with a neutral effect on quality. i.e. an effect which alters the character of the environment without affecting is sensitivities. As the drainage ditch onsite is to be infilled during construction works it would not be impacted from any subsequent operational works.

7.4.3 Operational Phase

Following construction of the proposed development the potential impacts in relation to water have been assessed under the following headings:

- increased surface water run-off;
- contamination of surface water;
- foul water; and
- water supply.

Surface water runoff

Without proper control measures, surface water can ingress into the surrounding environment. Louth County Council requires all new developments to adhere to the practice of Sustainable Urban Drainage Systems (SuDS) for the control of surface water on site. This is highlighted in the Planning Strategy for the Greater Drogheda Area

An increase in the hardstanding area in the development will result in an increase of surface water runoff from the site. The total proposed impermeable area including roads, carparking and roofs area is 4.5ha.

Contamination of Surface Water

Within the curtilage of the site there is a potential for leaks and spillages due to the vehicle movements, and parked cars. Any accidental emissions of oil, petrol or diesel could cause localised contamination if the emissions enter the water environment without mitigation through the use of an onsite interreceptor.

Foul water

The proposed development will lead to an increase in foul water discharge. As part of design it is proposed that the foul sewerage from the site will drain via gravity and outfall to the existing 225 mm diameter foul sewer on Marsh Road to the north of the subject site. The connection to this sewer will be via c. 430m of new 225mm diameter sewer to be constructed as part of the LIHAF access road. The public foul sewer system has sufficient capacity in the area. Foul water will drain to the existing Irish Water Pump Station on Marsh Road where it is pumped via a rising main to the nearby Drogheda Wastewater treatment plant. Irish Water have confirmed that there is sufficient capacity in the wastewater network to service the proposed development.

Water supply

The proposed development will result in an increased demand for water of 200 m^3/day. Irish Water has confirmed this resource is available within the existing network.

7.4.4 Assessment of Impact Pre-Mitigation - Operation

Based on the points above in relation to the operation phase the potential impact on the land soils, geology and hydrogeology during operation (EPA 2017) is considered to have a long-term slight effect with a neutral effect on quality i.e. an effect which alters the character of the environment without affecting is sensitivities. This is due to the increase in surface water runoff due to the local increase in hardstanding.

7.5 Mitigation Measures

The design of the proposed development has taken account of the potential impacts of the development and the risks to the water environment local to the area where construction is taking place. Measures have been developed to mitigate the potential effects on the local water environment. These measures seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

A project-specific Construction Management Plan (CMP) is to be established and maintained by the contractors during the construction and operational phases of the proposed project. The Plan will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures. As a minimum, the CMP will be formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;

- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

Project Engineers (Waterman Moylan) have outlined construction design measures for the site in their Engineering Report. The following mitigation measures include, but are not limited to, those provided in that report and are designed to address the impacts associated with the construction and operational phase of the project. Due to the inter-relationship between this section and Chapter 6 (Land, Soils, Geology and Hydrogeology) the following mitigation measures discussed will be considered applicable to both.

7.5.1 Construction Phase

During the construction phase, mitigation measures have been applied for potential impacts.

The mitigation measures will ensure that no sediment contamination, contaminated runoff or untreated wastewater will enter any onsite drainage ditches or off-site watercourses during the construction of the proposed development.

Increased runoff and sediment loading

During the construction phase any drains carrying a high sediment load will be diverted through settlement ponds/tanks. The settlement ponds/tanks will be located between the area of construction and the nearest field drain. Surface water runoff will not be discharged directly to local watercourses. The following mitigation measures will be adopted;

- the drainage system and settlement ponds/tanks will be constructed as a first step;
- silt reduction measures including sit traps and settlement tanks will be employed during construction;
- any excavations required will remain open for as little time as possible before the placement of fill. This will help to minimise potential for groundwater ingress into excavations;
- the drainage ditch identified to the south of the site will be infilled;
- weather conditions will be considered when planning construction activities to minimise risk of run off from the site; and
- distance between topsoil piles etc. and drainage courses will be maintained – to protect from dampening operations.

A preliminary Construction Management Plan has been undertaken by Waterman Moylan Consulting Engineers and is submitted under separate cover.

Contamination of Local Water Courses

To minimise any impact on minor drainage channels onsite from material spillages, all oils, solvents, paints and fuels used during construction will be stored within temporary bunded areas and each of these areas will be bunded to a volume of 110% of the capacity of the largest tank/container within it (plus an allowance of 30 mm for rainwater ingress). Filling and draw-off points will be located entirely within the bunded area(s). Drainage from the bunded area(s) will be diverted for collection and safe disposal. There is no notable surface water course onsite. The drainage ditch to the south is to be infilled as part of the initial construction works.

Wet concrete operations adjacent to watercourses will be avoided where possible. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to groundwater.

The contractor will be required to make provision for removal of any concrete wash waters, most likely by means of tankering off-site and no such wash waters will be discharged to groundwater. Any effluent generated by temporary onsite sanitary facilities will be taken off-site for appropriate treatment.

Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles/ equipment will take place in designated bunded areas where possible. Re-fuelling will be avoided in so far as possible at the other work sites but where necessary will take place on hard stand areas and fuel stored in bunded areas.

If it is not possible to bring a machine to the refuelling point, fuel will be delivered in a double skinned mobile fuel bowser. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur. The vehicles and equipment will not be left unattended during refuelling. Spill kits and hydrocarbon absorbent packs will be stored in the cab of each vehicle and operators will be fully trained in the use of this equipment.

The generation of runoff from stockpiles of soils, excavated during construction, will be prevented from entering watercourses by diverting runoff to the settlement ponds/tanks on site, and removing the material off-site as soon as possible to designated storage areas.

7.5.2 Operational Phase

Increased Surface Water Runoff

The proposed drainage system for the site in outlined in Waterman Moylan's Engineering Planning Report and has been designed in accordance with Greater Dublin Strategic Design System (GDSDS) specifications. The drainage system will include a Stormtech attenuation system or similar. This increase flow will be directed to the proposed attenuation tanks (3 in total). The attenuation tanks are adequately sized with a total attenuation volume of 2,485m^3 by way of drainage calculations. The attenuation system will be fitted with a hydrobrake flow control mechanism limiting total outflow to the allowable greenfield runoff rate. Refer to the attached report

by Project Engineers Waterman Moylan for further information. Roof water will be directed into filter drains installed within individual properties. A hydrobrake will also be installed at the outflow to reduce the ultimate discharge.

Waterman Moylan have identified that the above storm water drainage systems will accommodate a 1:100-year storm event accounting for a 20% increase with climate change.

As such these will be no change in the green field run-off from the site and no measureable impact on receiving waters.

Contamination of surface water

Due to a variety of measures such as the design of the attenuation system with hydrocarbon interceptors and the design of the wider drainage system in line with SuDS the likelihood of any spills entering the water environment is negligible.

Run-off from the car park areas and access roads will drain into one of the following three options:

- Filter drains and swales - utilised in grass verges alongside estate roads
- Permeable pavement
- Underground attenuation tank –below the open space, crèche garden and car-parking areas.

Foul water

In their Engineering Assessment Report Waterman Moylan have proposed that a 225mm Ø gravity foul sewer network be constructed across the site which will connect into the existing 225mm Ø diameter public foul sewer on Marsh Road. The increase in flow to the existing public foul sewer is not expected to have a negative effect on the foul drainage system in the area.

Water supply

The water system will be metered to facilitate detection of leakage and the prevention of water loss. Dual & low flush toilets, aerated showerheads, spray taps, draw off tap controls, rainwater reuse are some of the water saving measures boing proposed. The increase in demand for water supply is not expected to have a negative effect on the water supply in the area as IW has confirmed there is adequate capacity available.

7.6 Predicted Impacts of the Proposed Development

The proposed development will have no significant impact on the natural surface water regime either qualitatively or quantitatively.

7.6.1 Construction Phase

Following the implementation of mitigation measures detailed in Section 7.5, the predicted impact on the surface water environment during construction phase (in accordance with EPA Draft EIA Guidelines, 2017) is considered to be Likely, Neutral, Imperceptible and Short-term. This is due to the control measures highlighted in section 7.5.1 above.

7.6.2 Operational Phase

Following implementation of the mitigation measures proposed in Section 7.5, the predicted impact on the surface water environment once the development is constructed and operational (in accordance with EPA Draft EIA Guidelines, 2017) is considered to be Likely, Neutral, Imperceptible and Long-term. This is due to the medication measures highlighted in section 7.5.2 above meaning there will not be a change to the greenfield runoff rate onsite There will be no impact to the quality of local watercourse and the nearby SAC by the deployment of oil interceptors.

7.6.3 'Do Nothing Scenario'

Do nothing' scenario refers to the environment as it would be in the future should the subject project not be carried out. Should the project not proceed the site would remain in its current state with the only likely impact on the local surface water system due to agricultural processes. The continued use of the site for agricultural purposes is likely to have a Neutral and Imperceptible effects on the environment.

7.6.4 'Worst Case Scenario'

Worst case scenario refers to effects arising from a project in the case where mitigation measures substantially fail. With respect to hydrology substantial failure of the construction mitigation measures could result in localised surface water quality impacts due to e.g. leaks from construction vehicles when refuelling beside the drainage ditch identified to the south of the site prior to infilling or wet concrete works increasing the alkalinity resulting in water quality impacts in the Stagrennan Stream (2km downgradient of the site). This would be a temporary impact and based on the hazard potential i.e. volume of fuel stored etc the impact would be localised. The stream is not used as a potable water supply, is not listed as a salmonid river etc. A Stage 2 Appropriate Assessment has been undertaken and a Natura Impact Statement accompanies this application.

7.7 Monitoring

7.7.1 Construction Phase

Regular inspection of surface water run-off and any sediment control measures e.g. silt traps will be carried out during the construction phase. Regular auditing of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling in designated areas etc.

7.7.2 Operational Phase

No future surface water monitoring is proposed as part of the proposed development due to the low hazard potential at the development Petrol interceptor(s) will be maintained and cleaned out in accordance with the manufacturer's instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to ground.

7.8 Interactions

7.8.1 Land, Soil, Geology and Hydrogeology

As previously stated there is an inter-relationship between hydrology and land, soils, geology and hydrogeology. There will be no potential cumulative impacts on the bedrock as the aquifer vulnerability is '*Low'* and the aquifer is locally important with little importance regionally.

Surface water run-off may have the potential to enter soil and groundwater. Implementation of appropriate mitigation measures as outlined in Section 7.6 will eliminate the potential for the influx of surface contaminants into the underlying geology and hydrogeology.

7.8.2 Biodiversity

The drainage ditch onsite is to be infilled during construction. It is presently not a sensitive water course, in terms of spawning fish and so this impact is unlikely to be significant. There are no sensitive fisheries habitats downstream as the River Boyne in this location is tidal in nature and the discharge point of the Stagrennan is 2km northeast of the site. See Chapter 5 *Biodiversity* and the accompanying *Appropriate Assessment and Natural Impact Statement* for additional information.

7.9 Potential Cumulative Impacts

The primary potential cumulative impact considered is the change of/interruption to the current surface water drainage in the local area. Given the relative scale of the proposed development and that of the hydrological environment in which it is based i.e. no notable surface water feature onsite the potential cumulative impact with respect to the hydrology of the local and surrounding areas is deemed to be not significant.

The site is currently in agricultural use, as are the neighbouring lands to the west and. However, these lands have been zoned by LCC for potential future development. Development of these lands would potential result in an increase in hardstanding decreasing the local recharge to ground and possible pluvial flooding. However, in the context of the larger hydrological environment on which they are based the potential cumulative impact is deemed to be not significant due to the relative size of the lands to be developed.

7.10 References

EPA, (2017). *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (August 2017); Environmental Protection Agency, Co. Wexford, Ireland

EPA, (2015). Draft *EPA Advice Notes for Preparation of Environmental Impact Statements*; Environmental Protection Agency, Co. Wexford, Ireland.

NRA, (2009). *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*; June 2009. National Roads Authority, Dublin.

APPENDIX 7.1

CRITERIA FOR RATING SITE ATTRIBUTES – ESTIMATION OF IMPORTANCE OF HYDROLOGY ATTRIBUTES

NATIONAL ROADS AUTHORITY (NRA, 2009)

Table 1 Criteria for rating Site Attributes - Estimation of Importance of Hydrology Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	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.
Very High	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
High	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
Medium	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
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people