Natura Impact Statement

Cork County GAA Board Lands

Old Whitechurch Road

Kilbarry, Co. Cork

Doherty Environmental Consultants Ltd.

June 2022

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Natura Impact Statement

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

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1.0 INTRODUCTION

Doherty Environmental Consultants (DEC) Ltd. has been commissioned by Cork County GAA Board to prepare a Natura Impact Statement (NIS) for a proposed Strategic Housing Development (SHD) at Old Whitechurch Road, Kilbarry, Cork (see Figure 1.1 for the location of project site and Figure 1.2 for a current aerial view of the project site).

In accordance with Article 6(3) of the Habitats Directive, as transposed into Irish law by Regulation 42(1) and Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015 (i.e. the "Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) (i.e. the "Planning and Development Act"), a Screening Report for Appropriate Assessment (AA) was prepared to assess whether it could or could not be ruled out, on the basis of objective information, that the project, either individually or in combination with other plans or projects, was likely to have a significant effect on any European Sites. The Screening Report for Appropriate Assessment was prepared by DEC Ltd. on behalf of the Cork County GAA Board and is provided as Appendix 1 to this NIS. The Screening Report for Appropriate Assessment concluded, in view of best scientific knowledge and the conservation objectives of the European Sites occurring within the zone of influence of the project, that, in the absence of appropriate mitigation, it could not be ruled out at the screening stage that the project would not result in significant adverse effects to two European sites, namely the Cork Harbour SPA and the Great Island Channel SAC. The conclusion of the Screening Report was informed by a highly precautionary approach and adopted a worst-case scenario. Such an approach was adopted to ensure consistency with the extremely low threshold for triggering likely significant effects as determined in both European and Irish case law and Section 177U of the Planning and Development Act. On the basis of that conclusion, it has been determined that AA is required in order to assess the implications of the project for those two European Sites. In accordance with Section 177T of the Planning and Development Act an NIS of the project has been prepared in order to assist An Bord Pleanála in carrying out its Appropriate Assessment. This NIS provides an examination, analysis and evaluation of the likely impacts from the Project, both individually and in combination with other plans and projects, in view of best scientific knowledge and the conservation objectives of the European Sites concerned. It also prescribes appropriate mitigation to ensure that the Project will not adversely affect the integrity of those sites identified as being at risk of likely significant effects. Finally, it provides complete, precise and definitive findings, which are capable of removing

all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned.

1.1 STATEMENT OF AUTHORITY

This Natura Impact Statement has been prepared by Mr. Pat Doherty BSc., MSc, MCIEEM, of DEC Ltd. Mr. Doherty is a consultant ecologist with over 20 years' experience in completing ecological impact assessments and environmental impact assessments. Pat has been involved in the completion of assessment reports for proposed developments and land use activities under the EIA Directive and Article 6 of the Habitats Directive since 2003 and 2006 respectively. He has extensive experience completing such reporting for projects located in a variety of environments and has a thorough understanding to the biodiversity issues that may arise from proposed land use activities. Pat was responsible for completing one of the first Appropriate Assessment reports for large scale infrastructure developments in Ireland when he prepared the Appropriate Assessment for the N25 New Ross Bypass in 2006/07. Since then Pat has completed multiple examinations of both plans and projects in Ireland. He has completed Natura Impact Statements for national scale plans such as Ireland's CAP Strategic Plan and National Seafood Development Plan and regional and county scale plans including County Development Plans, Local Area Plans, Tourism Strategies and Climate Action Plans. Pat has completed multiple Natura Impact Statements for a range of development types that include large scale infrastructure developments in sectors such as transport and energy as well as industrial, commercial and residential developments.

Pat has completed focused certified professional development training in Appropriate Assessment as well as in a range of ecological survey techniques and assessment processes. Training has been completed for National Vegetation Classification (NVC) and Irish Vegetation Classification (IVC) surveying, bryophyte survey for habitat assessment and identification, professional bat survey and assessment training, mammal surveying and specific training for bird and bat survey techniques. Ongoing training has been completed by approved training providers such as CIEEM, British Trust for Ornithology, the Botanic Gardens and the Field Studies Council.

1.2 SUMMARY OF SCREENING REPORT FOR APPROPRIATE ASSESSMENT

The Screening Report identified two European Sites, the Cork Harbour SPA and the Great Island Channel SAC, occurring within the wider zone of influence of the project site. These sites are shown in Figure 1.2 below and their location with respect to the project site is also shown.

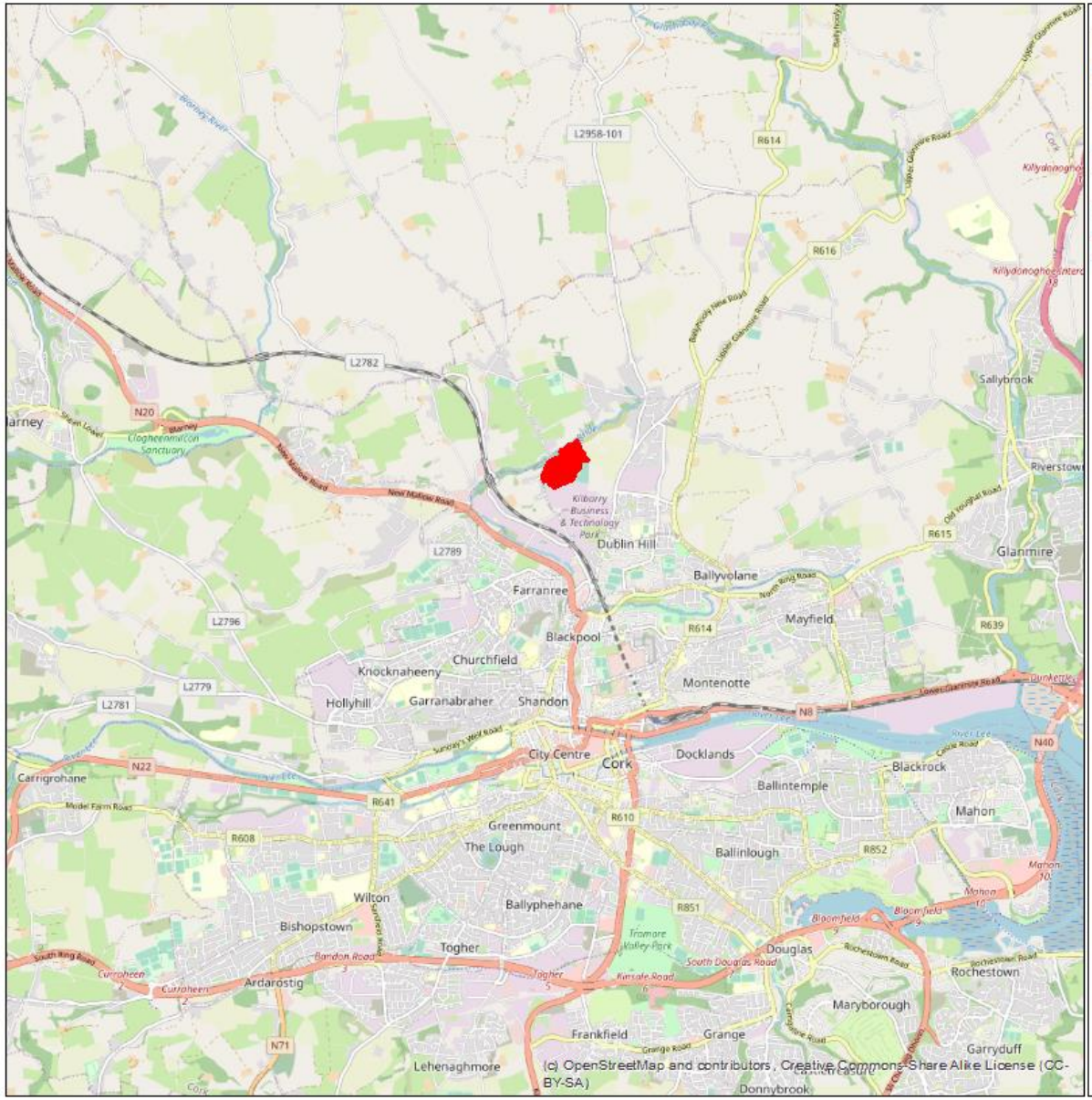
The likely significant effects to the Cork Harbour SPA and its special conservation interest bird species and wetland habitats, as identified during the Screening Report, relates to the presence of a hydrological pathway linking the project site to the River Lee Estuary, in which sections of the SPA are located. The section of the SPA comprises intertidal wetland habitats relied upon for foraging and roosting by special conservation interest bird species of the SPA.

During the Screening of the project it could not be ruled out that the project did not have potential to result in downstream effects to special conservation interests bird species and wetland qualifying habitats relying upon the Lee estuary section of the SPA by virtue of its potential to generate polluted surface water within project site and to discharge such water to the River Bride and downstream to the River Lee Estuary and Cork Harbour SPA. It was acknowledged during the Screening Report that any contaminated surface drainage waters being discharged into the River Bride and downstream to the Lower River Lee are likely to be well diluted and distributed within this water body, thereby limiting their potential to result in significant downstream effects. However the Screening Report and its conclusions have been underpinned by a precautionary approach and the very low threshold (i.e. the mere probability for a significant effect to occur) required to trigger a Stage 2 Appropriate Assessment and based on this approach it was found that the potential for such downstream effects to arise as a consequence of the project and to result in significant negative impacts to the conservation objectives of the Cork Harbour SPA could not be ruled out at the screening stage.

During the Screening Report a wastewater pathway was identified between the project site and the Cork Harbour SPA and the Great Island Channel SAC by virtue of the proposal to discharge wastewater generated at the project site during its operation phase to the Carrigrennan WWTP outfall located at Lough Mahon. While it was acknowledged in the Screening Report that the additional loading generated by the project will represent a miniscule fraction of the overall loading at the WWTP, the precautionary approach adopted for the Screening Report and the very low threshold required to trigger a Stage 2 Appropriate Assessment resulted in a finding

that, on the basis of objective information, the potential for this additional loading to result in negative impacts to the conservation objectives of the Cork Harbour SPA and Great Island Channel SAC could not be ruled out at the screening stage.

In summary based on the information provided in the Screening Report, the precautionary approach adopted during the consideration of impacts for the Screening Report and the extremely low threshold required to trigger Stage 2 Appropriate Assessment, it was concluded that the potential for significant effects to the Cork Harbour SPA and the Great Island Channel SAC as a result of the discharge of contaminated surface drainage waters and wastewater could not be ruled out. As such the Screening Report concluded that an NIS was required to evaluate further the potential for these impacts to result in significant adverse effects to the Cork Harbour SPA and the Great Island Channel SAC and where necessary prescribe mitigation measures to avoid such adverse effects.



Residential Development Cork County GAA Board Lands

Figure 1.1

Location of the Project Site

Site Boundary

0 0.5 1 2 Km

N
W E
S

Drawn By	PD
Date	23/10/2021
Data Source	Bing

Residential Development Cork County GAA Board Lands

Figure 1.2

Aerial View of the Project Site

Site Boundary

0 0.0275 0.055 0.11 Km

N
W E
S

Drawn By	PD
Date	23/10/2021
Data Source	Bing

1.3 GUIDANCE

This NIS has been undertaken in accordance with National and European guidance documents: Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (DEHLG 2010) and *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats directive 92/43/EEC.* The following guidance documents were also of relevance during this the preparation of this NIS:

- A guide for competent authorities. Environment and Heritage Service, Sept 2002. Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010). DEHLG.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/42/EEC. European Commission (2021).
- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats directive 92/43/EEC. European commission (2018).

The information provided in this NIS is also guided by European and Irish case law guiding the approach to Stage 2 Appropriate Assessment. In particular it is noted that the consideration of impacts provided in Section 4 this NIS has been undertaken in the absence of any regard to construction phase best practice measures and environment safeguards and operation phase design measures that aim to safeguard the receiving environment and the Cork Harbour SPA and Great Island Channel SAC from potential adverse impacts

1.3.1 Background to Habitats Directive Article 6 Assessments

The EC (2001) guidelines outline the stages involved in undertaking an assessment of a project under Article 6(3) and 6(4) of the Habitats Directive. The assessment process comprises the four stages outlined below. Stages 1 to 3 form part of the Article 6(3) process, while Stage 4 forms part of the Article 6(4) process. This NIS presents the findings of an examination, analysis and evaluation of the project to inform a Stage 2 Appropriate Assessment of the project.

- Stage 1 – Screening: This stage defines the proposed plan, establishes whether the proposed plan is necessary for the conservation management of the European Site and assesses the likelihood of the plan to have a significant effect, alone or in combination with other plans or projects, upon a European Site.

- Stage 2 – Appropriate Assessment: If a plan or project is likely to have a significant affect an Appropriate Assessment must be undertaken. In this stage the impact of the plan or project to the Conservation Objectives of the European Site is assessed. The outcome of this assessment will establish whether the plan will have an adverse effect upon the integrity of the European Site.

- Stage 3 – Assessment of Alternative Solutions: If it is concluded that, subsequent to the implementation of mitigation measures, a plan has an adverse impact upon the integrity of a European Site it must be objectively concluded that no alternative solutions exist before the plan can proceed.

- Stage 4 – Where no alternative solutions exist and where adverse impacts remain but imperative reasons of overriding public interest (IROPI) exist for the implementation of a plan or project an assessment of compensatory measures that will effectively offset the damage to the European Site will be necessary.

1.3.1.1 Stage 2: Appropriate Assessment

The EC Guidance Assessment Criteria for a Stage Two Appropriate Assessment seeks the following information:

1. the collection of information on the project and on the European Sites concerned;

2. An assessment of the implications of the project in view of the site's conservation objectives, individually or in combination with other plans or projects;

3. An evaluation as to whether the project can have adverse effects on the integrity of European Sites;

4. The consideration of mitigation measures (including their monitoring).

This NIS addresses each of these items, through the following sections provided below.

1.4 SCIENTIFIC INVESTIGATIONS

A range of scientific site investigations have been completed for the project and these are relied upon in this Natura Impact Statement. These scientific investigations include baseline biodiversity assessments; contaminated land site investigations; and hydrological site investigations. The methods used during the completion of these site investigations are described in full in the EIAR that has been prepared for the project and that accompanies the planning application documentation and this Natura Impact Statement.

2.0 PROJECT DESCRIPTION

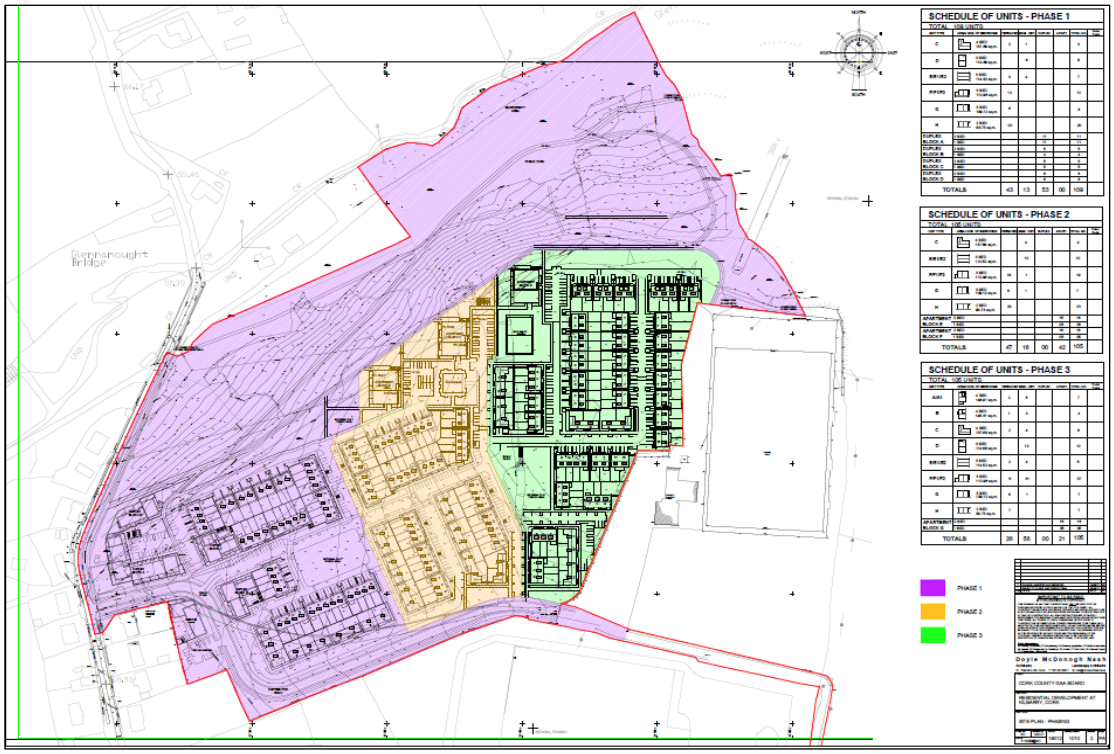
The proposed development will consist of a strategic housing development of 319no. residential dwellings comprising of 85no. semi-detached units (comprising of 17no. 4-bed units, 62no. 3-bed units and 6no. 2-bed units), 118no. terraced units (comprising of 8no. 4-bed units, 42no. 3-bed units and 68no. 2-bed units), 53no. duplex units (comprising of 26no. 1-bed units, 24no. 2-bed units and 2no. 3-bed units) and 63no. apartments (in 3no. part 4 storey and part 5-storey blocks and comprising 15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70sqm.

The proposed development will also consist of the demolition of a disused hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle and car parking, including EV and disabled parking, ESB substations, groundworks, foul drainage works, stormwater drainage proposals including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.

Figure 2.1: **Proposed Development (DMNA Architects)**

The construction of the proposed development will be completed in three phases, with the first phase of 109 units serviceable without the requirement for infrastructure upgrades outside of the site by Irish Water. The second and third phases of the development will include approximately 105 units in each phase, subject to final detailed agreement with the Local Authority and utility providers.

Figure 2.2: Proposed Phasing Plan (DMNA Architects)



2.1.1 Proposed Phasing

It is estimated that the proposed phases will take 36 months to complete, with approximately 12 months construction for each of three phases. A Construction and Environmental Management Plan prepared by JB Barry Consulting Engineers outlining the process is included with the planning application and provided under separate cover as part of the planning application documentation.

Proposed roads, houses, apartments and the creche will be developed as close to existing ground levels as is possible. However, given the relatively steep existing topography and the need to achieve reasonable longitudinal gradients along roads and Part M access into residential units and the creche, it will be necessary to excavate and fill across the site to achieve acceptable levels. The design of the development will balance the extent of cut and fill, in so far as practically achievable, to ensure that there is not a significant surplus or deficit of material required.

Prior to any Phase 1 construction works being carried out, the proposed development will initially involve some site clearance, the demolition of existing, disused commercial buildings and stone houses structures and earthworks in order to clear and grade the site to accommodate the construction of all associated engineering works and subsequently the building foundations.

Development will commence at the western side of the site adjoining the Old Whitechurch Road and move across to the site's eastern side and the boundary with Delaney's GAA Club.

Phase 1

Phase 1 of the proposed development is to comprise the construction of 109no. residential units at the western side of the site, adjoining the Old Whitechurch Road. These units are the comprise:

3no. Type C 4-bed dwellings, each 137.69sqm in area

8no. Type D 3-bed dwellings, each 114.68sqm in area

7no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area

12no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area

6 no. Type G 3-bed dwellings, each 109.12sqm in area

20no. Type H 2-bed dwellings, each 83.73sqm in area

4no. duplex blocks comprising

Block A: 11no. 1-bed units and 11no. 2-bed units

Block B: 4no. 1-bed units and 5no. 2-bed units

Block C: 5no. 1-bed units and 5no. 2-bed units

Block D: 6no. 1-bed units and 6no. 2-bed units

The phase will include the construction of the east-west distributor roadway along the site's southern boundary. This phase will also see the construction of the community creche and associated parking adjacent the roadway.

This phase also incorporates the development of a public park to the north of the main area of the proposed development footprint. While the park terrain here is too severe to accommodate active play in terms of games, it is proposed to provide walking and bicycle routes in excess of 2kms. mown turf open space areas for passive recreation are to be provided where the slope condition is least severe and where more severely sloped, it is proposed to accommodate a range of woodland and open meadows with long and short grass management interspersed with parkland specimen tree planting to keep the landscape sufficiently open to view.

Phase 2

Phase 2 comprises the central area of the site and is to comprise the construction of 105no. residential units. These units are the comprise:

4no. Type C 4-bed dwellings, each 137.69sqm in area

10no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area

19no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area

7 no. Type G 3-bed dwellings, each 109.12sqm in area

23no. Type H 2-bed dwellings, each 83.73sqm in area

2no. apartment blocks comprising

Block E: 5no. 1-bed units and 16no. 2-bed units

Block F: 5no. 1-bed units and 16no. 2-bed units

Phase 3

Phase 3 comprises the central area of the site and is to comprise the construction of 105no. residential units. These units are the comprise:

7no. A/A1 4-bed dwellings, each 146.91sqm in area

4no. Type B 4-bed dwellings, each 146.31sqm in area

6no. Type C 4-bed dwellings, each 137.69sqm in area

10no. Type D 3-bed dwellings, each 114.68sqm in area

6no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area

37no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area

7 no. Type G 3-bed dwellings, each 109.12sqm in area

7no. Type H 2-bed dwellings, each 83.73sqm in area

1no. apartment block comprising

Block G: 5no. 1-bed units and 16no. 2-bed units

2.1.2 Key Development Statistics

A detailed floorspace schedule is set out in the Housing Quality Assessment prepared by DMNA Architects and submitted with the planning application. The principal development statistics are as follows:

Table 2.1: Key Development Statistics

Development Statistic	Proposed Development
Site Area	15.52ha
Gross Demolition Area	695sqm
No. Residential Units	319 No. residential units, to include: • 85 no. semi detached • 118 no. terraced • 53 no. duplex units • 63 no. apartments
Gross Floor Area	33,738.70m^2 to include: • 33,199.70m^2 residential • 539m^2 creche and substations
Building Height	House Types A/A1/B – 3 Storeys House Types C/C1/D/E/E1/E2/F/F1/F2/G/H/J – 2 Storeys Duplex Blocks A/B/C/D – 3 Storeys Apartment Blocks E/F/G – 5 Storeys Creche – 2 Storeys
Resident Support Facilities	Creche – 519 m^2
Resident External Amenity Space	Total Open Space Provision on overall lands – 7.051ha (45%) Total Active Open Space on overall lands – 2.777ha (18%) Active Open Space within developable area 1.22ha (14%)
Part V	64no. units, as follows: • 8no. Type F/FI/F2 Terrace Units • 2no. Type F/FI/F2 Semi-Detached Units • 2no. Type G Terrace Units • 10no. Type H Terrace Units • 32no. 2-bed Apartments • 10no. 1-bed Apartments
Plot Ratio	0.41
Site Coverage	17%
Residential Density	38.77 units/ha on developable area
Aspect	100% of Duplex Units benefit from dual aspect 81% of apartments benefit from dual aspect
Cycle Spaces	124no. cycle spaces
Motorbike Spaces	12no. parking spaces
Car Spaces	534no. parking spaces
Substations (4no.)	20m^2 (in total)

2.1.3 Design Approach

The following design objectives have informed the design process of the proposed scheme

Creation of a high-quality living environment for residents and enhancement of the social, environmental, and visual quality of the area;

Design of the layout to discourage anti-social behaviour, particularly by ensuring that the development overlook all access, parking, and public open areas;

Promoting the concepts of enclosure, the clear separation of public/ private realm and permeability as the means to achieve a high-quality residential environment; and

Maximise amenity and energy efficiency through climate sensitive design that takes account of orientation and typography, and the retention of existing site features of merit.

The overall approach to the design of the proposed development is as follows:

The design layout responds to the site's topographical context, and to on-site constraints and potentials. The development proposes a new access from the Old Whitechurch Road north of the existing houses bounding the site. This distributor road is then proposed along the southern boundary of the site to link through towards the Delaney's GAA club lands to the east and along with the landscaped edge to the south of it creates a buffer between the existing industrial estate and the proposed housing development.

Throughout the scheme, appropriate responses are made to the nature of specific boundary conditions. The development is designed with housing generally backing onto the existing boundary with the Delaney's GAA club lands, but to then look out over the existing open space zoned lands to the north and towards the distributor road to the south of the site. The open space zoned lands are proposed as a new public park, with significant pedestrian and cycleways to link to both the east and west to create a large riverside amenity. To ensure overlooking of this space and to a strong urban edge 3 apartment buildings are proposed along the boundary of the residential areas and the public park. These apartment step down a full level, in order to address

the level change along this interface and to create a linear usable open space area immediately adjacent to the residential development within the public park.

The design's overall form, architecture & landscaping respond suitably to the location creating a sense of place and the development positively contributes to the character and identity of the neighbourhood.

The site is located within an existing urban environment on the northern fringe of Cork City. A number of new connections are proposed from the site to neighbouring facilities and infrastructure. A new distributor road with footpath and cycleway facilities is proposed along the southern section of the site linking the old Whitechurch Road to the Delaney's GAA lands to the east. In addition to this cycleway heading west to east two other cycleways are included heading north south through the development. The first links the public plaza adjacent to the creche to the public park along the northern fringe of the site. The second cycle route links from the distributor road at its eastern end within the site through the scheme linking the second plaza space with the various recreation facilities included within the development such as the playground, kick about are and the external gym and finally onto the cycle routes within the public park. These route and the development's layout with cycleways and pedestrian connections from it into the development will also make it easy for a bus to serve the scheme

Within the scheme there is a range of public, communal and private amenity spaces and facilities for children of different ages, parents and the elderly. This ranges from the large public park with amenity walks, to a number of usable open space areas within the development which are designed for informal play to the recreation facilities located along the pedestrian and cycleway which runs north south through the development linking the distributor road to the public park through the development. These facilities include a public plaza designed to be suitable to external performances to a playground area for younger children, a kick about area for older children and an outdoor gym for adults and older people. Areas defined as public open space will also be clearly defined, accessible and open to all.

The houses, apartments and duplex units are designed and arranged on site to maximise solar gain. Houses are arranged to minimise the number of north facing rear gardens, and specific wide fronted house types have been designed so that all the main habitable rooms facing south maximise solar gain

Landscaped areas are designed to provide amenity and biodiversity. A range of amenity areas are provided which vary from the large public park to smaller pocket parks within the development. A biodiversity area is proposed to the northern section of the landholding along the Glenamought River[1] which will not be accessible to the public. The scheme will also incorporate sustainable urban drainage systems.

The layout makes the most of the opportunities presented the existing sloped ground of the river valley in the northern portion of the site through the creation of a new public park which is overlooked by the development and interconnected with it. In this regard the proposed apartment buildings are crucial, providing an urban edge, whilst also ensuring overlooking of a significant portion of the open space and also successfully exploiting views out of the site to the north and west.

In accordance with the Design Manual for Urban Streets and Roads, the design has a clear hierarchy of roads within the scheme. From the proposed distributor road to the south to the two linked local access roads within the scheme down to minor access roads and finally shared surfaces and homezones a clear hierarchy is designed throughout the scheme. Road widths, turning radii, surface finishes and detailing will differentiate each road type. Furthermore, dedicated pedestrian and cycling facilities are provided throughout the scheme linking each part of the development and also linking the development to neighbouring sites and facilities.

The streets are designed as places instead of roads for cars, helping to create a hierarchy of space with less busy routes having surfaces shared by pedestrians, cyclists and drivers, with traffic speeds controlled by design and layout rather than by speed humps

All public open space is overlooked by surrounding homes so that this amenity is owned by the residents and safe to use. A number of pocket parks are located throughout the development and these are designed so that they are overlooked by the adjacent houses. In this case shown

[1] Note that the Glenamought River is also known as and referred to as the River Bride

below the roads around the open space are pedestrian priority share spaces which ensures that the open space can be accessed safely from the houses surrounding it.

The public realm is considered as a usable integrated element in the design of the development. For example, in the public plaza space shown below is located along the north-south combined pedestrian and cycle route which traverses the site connecting the distributor road to the public park. The plaza incorporates the road adjacent to make it a pedestrian friendly space while also assisting in reducing traffic speeds at a key junction in the overall development.

The layout has been designed with car parking generally on-street or within easy reach of the home's front door. In all situations parked cars are overlooked by houses, pedestrians and traffic. In excess of 75% of units are provided with communal parking on the basis of 1 space per apartment and duplex unit, 1.5 spaces per 2 bed house and 2 spaces per house for houses of 3 and 4 bedrooms. This will ensure that the efficiency of parking spaces is maximised and allow for the accommodation of visitors without the need to provide additional dedicated spaces. Materials used for parking areas are of similar quality to the rest of the development and communal spaces are designed with significant landscaping to reduce the visual impact of parked cars on the development

Adequate secure facilities are also provided for bicycle storage, with all duplex units having shared covered bicycle parking areas provide either in open space areas of in communal semi-public courtyards to the rear of the units. All apartments have an internal bike storage area incorporated into the basement level where there are steps in level. Communal motorbike parking is provided within shared parking areas to all duplexes and apartments in accordance with the Cork City Development Plan.

Bin stores for the terraced houses have been designed within the public areas to be close to the houses they serve and small in nature so that they can be accommodated within landscaped areas and adequately screened. Bin stores for the apartments are incorporated internally into the basement floor level, where there are steps in section. For the duplex units, bin stores are generally either located on the property where possible through the creation of small private amenity areas at ground level. Where bin stores are shared they are located in sheltered areas within larger landscape public spaces such as between blocks A and B, or in the rear semi private courtyard of blocks C and D.

2.2 SURFACE WATER MANAGEMENT

During the operation phase it is proposed to discharge surface water from the project site to the Glenamought River along the northern boundary of the project site. It is proposed to convey the surface water to the river via an open drain. The open drain will be designed to form part of the landscape plan for the project and will ensure that flows are managed and erosion of the open drain does not occur.

The proposed surface water management design will include a storm drainage pipe network, attenuation storage structures and several SuDS features which will aid the reduction of runoff volumes by slowing surface water flows, providing the opportunity for evapotranspiration and providing the opportunity for infiltration to ground. Both the interception and attenuation storage requirements of GDSDS will be sufficiently met.

An assessment of the potential SuDS measures that could be incorporated within the site was conducted using the SuDS Manual, CIRIA 753 as guidance. The following SuDS features have been identified as applicable and will be provided within the proposed scheme:

- Green Roof: will be provided on the creche building. The green roof will be an extensive type with sedum planting at the surface with a drainage layer beneath. The drainage layer will convey flows to discharge locations. It is not proposed to restrict the discharges from the roofs.

- Permeable Paving: will be provided for all parking spaces. Permeable paving will be a Type B as per SuDS Manual, CIRIA 753, a combination of infiltration and piped drainage.

- Tree Pits/Bioretention Planters: will be provided in every feasible location where there is a proposed tree or planter. The tree pits will contain engineered soil filled tree boxes with drainage pipes beneath to link trees together and tie in with the proposed surface water sewer. The bioretention planters will consist of a shallow landscaped depression at the surface with a drainage layer beneath.

- StormTech Attenuation Tank: will be provided at the natural low points for final storage of runoff volumes before discharging to the existing river at a controlled rate.

- Attenuation will be provided by StormTech attenuation chambers which will cater for the 100-year storm event with a 10% climate change allowance added. The proposed surface water network has been split into two catchments, A and B. the outflow from Catchment A will tie in with the Catchment B network. The final storage location, Catchment B, is located in the largely undeveloped northern area of the site. The route from the final storage area to the final discharge location at the Glenamought River/River Bride must pass a protected butterfly habitat and navigate a steep decline to the river edge.

- To combat these issues, it is proposed to utilise directional drilling along the outfall route beneath the butterfly habitat at a depth of approximately 3.4m – 4.2m below existing ground. The underground drilling will be continued beyond the habitat area, as far as the transition from underground to open channel at manhole S77. From this point it is proposed, due to steepness of the gradient to the discharge location, to create a meandering open drain with check dams. The open drain will be designed in consultation with the landscape architect and ecologists to ensure that the open drain is considerate of the existing landscape and will ensure that flows are managed, and erosion of the open drain does not occur. It is proposed to discharge surface water from the final storage area at a maximum rate of Qbar (26.26 l/s).

In relation to electricity, 4no. new substations will be installed as part of the proposed development. This will have enough capacity for the proposed development, including the proposed EV charging points. A connection will be made to the existing network where there is sufficient capacity for the proposed development.

In relation to telecommunications and broadband, the developer is required to place an order with a telecoms provider for new fixed phone lines and fixed broadband connections.

2.3 FOUL WATER DRAINAGE

Wastewater collection within the proposed development will be via a network of gravity sewers for ultimate discharge to Irish Water's wastewater network in Old Whitechurch Road immediately to the west of the site. The wastewater collection system will be designed and constructed in accordance with Irish Water's Code of Practice for Wastewater Infrastructure to ensure self-cleansing velocities will be achieved on all pipe runs. Following a Pre-Connection

Enquiry, Irish Water have issued a Confirmation of Feasibility (COF) that the site can be serviced by its wastewater infrastructure network.

2.4 CONSTRUCTION PHASE

2.4.1 General construction Activities

The specific machinery that will be used on the site to construct the development is likely to include excavators, dumper trucks, mobile cranes, teleporters, and lorries together with small plant. There is a requirement for an amount of cut and fill to take place in addition to excavations for foundations, utility ductwork and sewer pipes. The potential impacts and mitigation measures for the general construction activities are dealt with in detail below. It is proposed that by phasing the construction and minimising the extent of soil removal together with the necessary cut and fill the impact of dust and run off etc. can be substantially reduced.

2.4.2 Demolition Works

The former hurley manufacturing shed building located towards the northwest of the site will be demolished.

2.4.3 Construction Phase Surface Water Management

Surface water will be generated at the project site during the construction phase. Measures will be required to be implemented to manage and treat surface water to prevent the discharge of contaminated surface water from the project site to the River Bride catchment.

2.4.4 Construction phase Wastewater Management

All wastewater generated during the construction phase will be held in serviced portable containers. These will be collected from the site and disposed of by an appropriately licenced waste contractor.

3.0 BASELINE DESCRIPTIONS

3.1 DESCRIPTION OF THE SITE LOCATION

The lands comprising the project site can be separated into two distinct sections, the relatively flat areas to the south and the areas which slope steeply down to the River Bride valley along the northern portion of the lands. There is a derelict building located to the Northwest corner of the site which was previously used as a Hurley making premises. Along the Old Whitechurch Road the lands fall steeply down to the road and there are high tension ESB cables and pylons which are located in the northeast corner of the site.

The land cover (as per Fossitt, 2000) at and surrounding the proposed development footprint within the project site is dominated by grassland habitats in the form of improved/semi improved grassland that has been traditionally subject to livestock grazing, scrub, areas of recolonising ground and made ground. Scrub occurs to the west of the developable area along with corrugated buildings. In the open space to the north of the developable area the ground slopes steeply to the north and a mix of unimproved grassland and established scrub and broadleaved woodland occur along the slopes. The grassland on the steep north facing slopes supports abundant Succisa pratensis and is known to support a population of marsh fritillary, a species listed on Annex 2 of the EU Habitats Directive.

Mammal surveys completed at the project site have not identified the presence of protected non-volant mammals within the proposed development footprint or the surrounding landholding. Otters are known to foraging along the Glenamought and Bride Rivers however no evidence indicating the presence of otters were observed along the section of the Glenamought River bounding, upstream or downstream of the landholding.

Surveys completed during the non-breeding season and overlapping with the occurring of non-breeding migratory wetland bird species in Ireland in September 2020, October 2021, November 2021 and April 2022 did not identify the presence of wetland birds and birds species listed as special conservation interest bird species of the Cork Harbour SPA occurring within or relying upon the project site. No wetland habitats occur within the project site and much of the habitat supported by the project site which consists of scrub and tall sward grassland habitats are unsuitable as foraging and roosting habitat for the special conservation interest bird species of the Cork Harbour SPA.

The Glenamought River forms the northern boundary of the project site. The Glenamought River is located within the River Lee surface water catchment and the Kiln_SC_010 sub-catchment. The water quality of the section of the Glenamought River to the north of the project site is currently under review and has not been assigned by the EPA. The section of the River Bride a short distance downstream, beyond Glenamought Bridge has been assessed by the EPA and has been classified as an "At Risk" waterbody under the Water Framework Directive (Water Framework Directive). The remainder of the River Bride downstream to its confluence with the River Lee has been classified as "At Risk". Nutrients in the form of ortho-phosphates in particular have been identified as having a negative impact on the water quality of the River Bride downstream.

Site investigations have been completed at the project site. No groundwater was encountered during the investigation works. Some made ground was discovered to the east of the site, up to 4m in depth. In addition some shallow bedrock was discovered on the west of the site between 0.6m and 2.3m in depth. The made ground area comprises fill that was illegally dumped by others in 1999 without the knowledge or permission of Cork County GAA Board. The matter has been previously resolved by the Board. The filled areas has been sampled and tested and the material therein has been confirmed as being non-hazardous and benign. Given that this material has been in place for over 20 years it is intended to leave this material in place and while it will require specialised foundation solutions to be employed for structures developed in this area it would not be sensible or practical to remove this material from the site at this stage.

3.2 DESCRIPTION OF THE CORK HARBOUR SPA

Cork Harbour SPA is a large European Sites consisting of a number of discrete sections associated with river estuaries. The section most relevant to the project site is that occurring along either bank of the River Lee Estuary. Other areas of the SPA are located in the outer River Lee estuary and Cork Harbour and these are considered in the context of this NIS by examining the potential for wastewater generated at the project site to combine with existing effluent discharges from the Carrigrennan WWTP outfall to result in negative effects to water quality and associated adverse effects to wetland habitats and bird species of the SPA.

The special conservation interests of Cork Harbour SPA include a list of 23 wetland bird species and wetland habitats.

The special conservation interest bird species (with EU Birds Directive Code No. in parenthesis) are as follows:

- Little Grebe (Tachybaptus ruficollis) [A004]
- Great Crested Grebe (Podiceps cristatus) [A005]
- Cormorant (Phalacrocorax carbo) [A017]
- Grey Heron (Ardea cinerea) [A028]
- Shelduck (Tadorna tadorna) [A048]
- Wigeon (Anas penelope) [A050]
- Teal (Anas crecca) [A052]
- Pintail (Anas acuta) [A054]
- Shoveler (Anas clypeata) [A056]
- Red-breasted Merganser (Mergus serrator) [A069]
- Oystercatcher (Haematopus ostralegus) [A130]
- Golden Plover (Pluvialis apricaria) [A140]
- Grey Plover (Pluvialis squatarola) [A141]
- Lapwing (Vanellus vanellus) [A142]
- Dunlin (Calidris alpina) [A149]
- Black-tailed Godwit (Limosa limosa) [A156]
- Bar-tailed Godwit (Limosa lapponica) [A157]
- Curlew (Numenius arquata) [A160]
- Redshank (Tringa totanus) [A162]
- Black-headed Gull (Chroicocephalus ridibundus) [A179]
- Common Gull (Larus canus) [A182]
- Lesser Black-backed Gull (Larus fuscus) [A183]
- Common Tern (Sterna hirundo) [A193]

The wetland habitats of the SPA include intertidal mudflats, saltmarshes and estuaries.

3.2.1 Documented threats & pressures

The NPWS have documented threats and pressures to the Cork Harbour SPA in their Natura 2000 Data Return Form for this SPA. The threats and pressures to this SPA have been ranked

in terms of low, medium and high impacts. These threats and pressures and their associated impact rank are as follows:

- Nautical sports (medium impact);
- Shipping lanes (medium impact);
- Fertilisation (medium impact);
- Leisure fishing (medium impact);
- walking, horseriding and non-motorised vehicles (medium impact);
- Marine and Freshwater Aquaculture (High Impact);
- Industrial or commercial areas (high impact);
- Roads, motorways (high impact);
- Urbanised areas, human habitation (high impact);
- Port areas (high impact).

In addition to the threats and pressures listed above the Conservation Objectives Supporting Documentation (NPWS, 2014) for the Cork Harbour SPA has identified activities within or in the vicinity of the River Lee Estuary and the associated sub-sites that have the potential to result in a disturbance effect to wetland bird species. The activities that have the potential to result in disturbance events to birds within these subsites are as follows:

1. Shipping channels;
2. Railway;
3. Power boating and water skiing; and
4. Walking, including dog walking.

3.2.2 Conservation Objectives

Site-specific Conservation Objectives for the Cork Harbour SPA have been published by the NPWS (NPWS, 2014a). The overall Conservation Objectives for the special conservation

interest bird species of the Cork Harbour SPA is to maintain the favourable conservation status of bird species for which the SPA is designated. The favourable conservation status of bird species will be achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

Favourable conservation status of wetland habitats is achieved when:

- its natural range, and area it covers within that range, are stable or increasing
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and;
- the conservation status of its typical species is favourable.

The site-specific Conservation Objectives for the Cork Harbour SPA aim to define the favourable conservation status its special conservation interest bird species. The site-specific Conservation Objectives for these species occurring within the sphere of influence of the project are outlined in Table 3.1 below.

Table 3.1: Site-Specific Conservation Objectives for Cork Harbour SPA Special Conservation Interest Species and the Great Island Channel SAC qualifying habitats

Attribute	Measure	Target	Notes
Cork Harbour SPA			
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document

Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent geese, Oystercatcher, Black-tailed Godwit, Dunlin and Redshank other than that occurring from natural patterns of variation	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation objectives supporting document.

3.3 DESCRIPTION OF GREAT ISLAND CHANNEL SAC

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats

[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. The location of these qualifying habitats of

the SAC with respect to the project site are shown in Figure 3.1. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

3.3.1 Existing threats & Pressures to Great Island Channel SAC

The Natura 2000 Standard Data Form for the Great Island Channel SAC has identified the following pressures as having a medium to high negative impacts to the status of the SAC:

- Grazing (medium impact);
- Non-native invasive species (medium impact);
- Reclamation of land from sea, estuary or marsh (high impact);
- Fertilisation (medium impact);
- Roads and motorways (high impact);
- Urbanised areas, human habitation (high impact);

- Marine and freshwater aquaculture (high impact); and
- Eutrophication (natural) (medium impact).

3.3.2 Great Island Channel SAC conservation objectives

Site-specific Conservation Objectives for the Cork Harbour SPA have been published by the NPWS (NPWS, 2014b).

The site-specific Conservation Objectives for the Cork Harbour SPA aim to define the favourable conservation status its special conservation interest bird species. The site-specific Conservation Objectives for these species occurring within the sphere of influence of the project are outlined in Table 3.2 below.

Table 3.2: Site Specific Conservation Objectives for the Great Island Channel SAC

Attribute	Measure	Target
Mudflats		
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex.
Saltmarsh		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession

Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stop	Maintain range of sub- communities with typical species listed in SMP

3.4 CORK HARBOUR WATER QUALITY

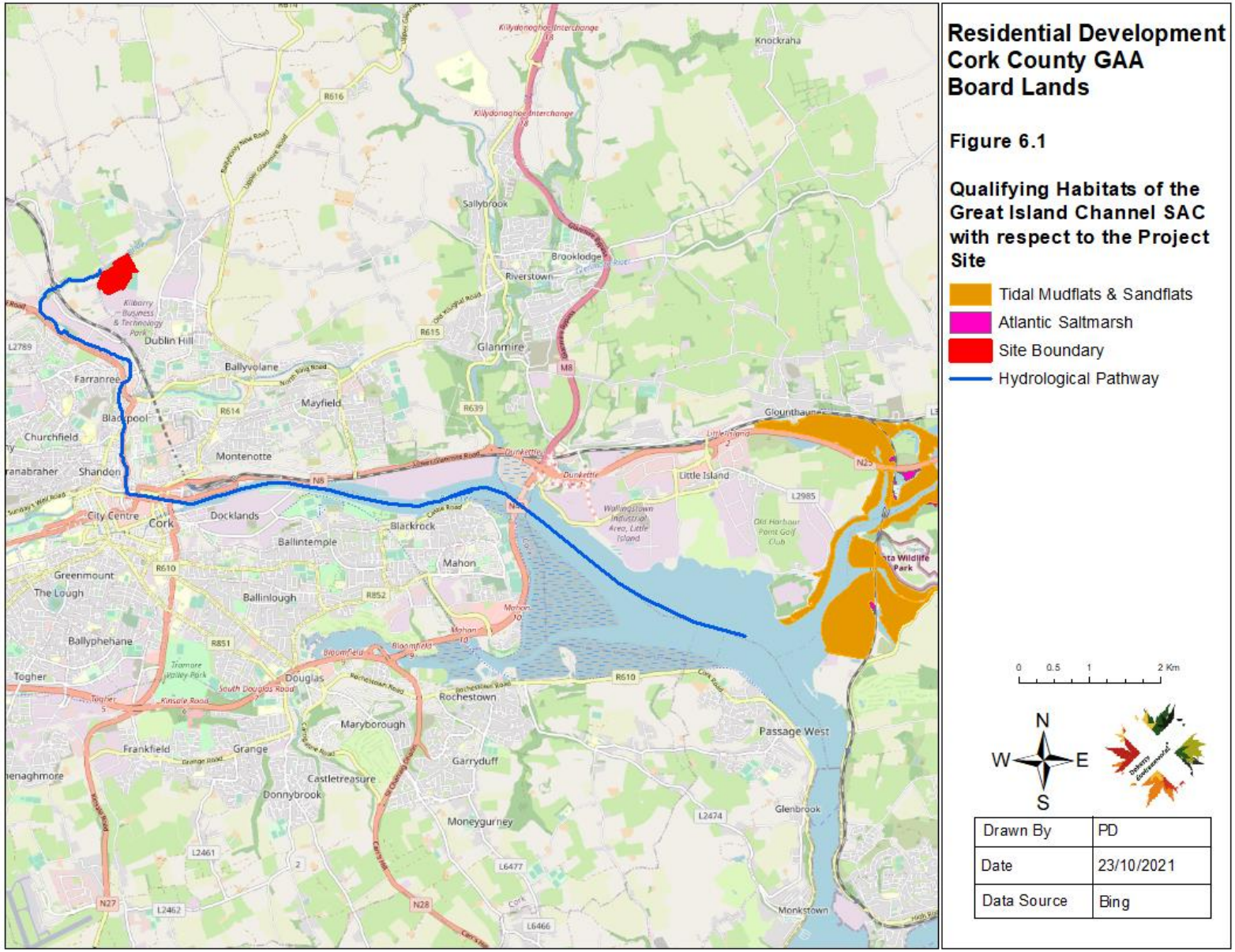
Cork Harbour has a history of problems associated with water pollution and eutrophication (e.g. ERU, 1989). Up to the 1960's most of the urban and industrial developments took place in Cork City and its immediate environs, and sewage and other waste were discharged directly into the River Lee. In the late 1980's, sewers were installed to convey waste water to two outfalls on the quays. While this improved water quality status upstream, the Lee Estuary and Lough Mahon regularly suffered from problems of increased concentrations of organic matter (BOD), nutrient enrichment, faecal coliform bacteria and a decrease in dissolved oxygen levels. In addition to the Lee Estuary and Lough Mahon, the Owennacurra estuary below Midleton has also suffered with serious pollution in the past; again linked to sewage outfalls (ERU, 1989).

Water quality in the Upper Harbour was improved by the engineering works conducted under the Cork Main Drainage Scheme, which included the building of Carrigrennan WWTP (Wastewater Treatment Plant) at Little Island, Co. Cork. The plant treats wastewater from Cork City and surrounding areas in the County including the City Environs, Glanmire and the proposed new town at Monard. The plant was commissioned in 2004 with a design organic load capacity of 413,000 population equivalent and provides primary and secondary treatment. Treated wastewater from the plant is discharged through a 500m long outfall pipe to Cork

Harbour at Lough Mahon. The design of the existing plant did not include for nutrient removal or disinfection and since the plant was commissioned the upper harbour has been designated as a sensitive area under the Urban Wastewater Treatment (Amendment) Regulations 2004 (SI 440/2004). Current discharges from the plant do not comply with these regulations with concentrations of total nitrogen and total Phosphorous exceeding the licenced emission limit values (ELVs), the causes of which have been attributed to the absence of Nitrogen and Phosphorous treatment at the wastewater treatment plant (Irish Water, 2020; Irish Water 2019). The EPA have identified that the limiting nutrient in the receiving waters is total phosphorus. It is expected that the ELV for total nitrogen will be amended in the licence.

Discussions are ongoing between IW and EPA in this regard. ELVs contribute to the receiving water achieving the environmental quality standards set in the European Communities Environmental Objectives (Surface Water) Regulations 2009, (as amended), which are aimed at providing a high degree of protection to the receiving water body (Cork County Council, 2020). The 2019 Annual Environmental Review (AER) (Irish Water, 2020) notes that phosphorous removal will be provided at the wastewater treatment plant.

Several locations around the lower harbour currently have no treatment facilities at all (Cobh, Passage West/ Monkstown, Carrigaline, Crosshaven and Whitegate/Agahda). However the continued provision of the Lower Harbour Main Drainage Scheme represents a significant investment in the Cork Area and will see the separation of storm and foul for the lower harbour towns of Cobh, Carrigaline, Ringaskiddy, Passage West, Monkstown and Crosshaven. The construction of a state of the art treatment facility at Shanbally (65,000PE) has already been completed and is now taking raw effluent from the towns of Carrigaline and Ringaskiddy. It is also noted that the Shanbally Plant uses a significant advancement in technology (The Nereda Process - advanced nutrient removal technology - Aerobic Granular Sludge (AGS)) resulting in capacity increases as well as extensive nitrogen removal. The Nereda treatment process will consistently produce high quality treated wastewater which can be safely discharged into sensitive environments (Cork County Council, 2020). In the meantime, a new wastewater treatment plant for Whitegate/Aghada has recently received planning approval in August 2021 (see Planning Reference No. 206463).


Residential Development
Cork County GAA
Board Lands
Figure 6.1
Qualifying Habitats of the Great Island Channel SAC with respect to the Project Site
Tidal Mudflats & Sandflats
Atlantic Saltmarsh
Site Boundary
Hydrological Pathway
0 0.5 1 2 Km
N
W
E
S
Drawn By PD
Date 23/10/2021
Data Source Bing
Knockraha
Killydonoghoe Interchange
Sallybrook
Brooklodge
Riverstown
Glanmire
Dublin Hill
Ballyvolane
Farranree
Blackpool
Mayfield
Churchfield
Montenotte
Shandon
City Centre
Cork
Docklands
Blackrock
Ballintemple
Mahon
Greenmount
The Lough
Ballinlough
Ballyphehane
Togher
Douglas
Rochestown
Maryborough
Frankfield
Grange
Castletreasure
Donnybrook
Garryduff
Moneygurney
Passage West
Glenbrook
Monkstown
Little Island
Glounthaune
Dunkettle
Wallingstown Industrial Area, Little Island
Old Harbour Point Golf Club
Fota Wildlife Park
Tramore Valley Park
R616
R615
R614
R639
R610
R852
R851
N8
N25
N27
N28
M8
L2789
L2985
L2461
L2462
L6477
L6466
L2474

The South Western River Basin District (SWRBD) River Basin Management Plan 2011 – 2015 covers the implementation of the Water Framework Directive (WFD) (2000/60/EEC) for the south-west coast of Ireland and covers Cork Harbour and its inflowing rivers and streams (SWRBD, 2010a).

In 2018 the water quality status of Cork Harbour was assessed as 'moderate'. The contributing factors were below standard levels of dissolved inorganic nitrogen (DIN) and dissolved oxygen (DO) with the Cork City agglomeration network being deemed as a source of pressure to the harbour's water quality.

However, recent improvements brought about as a result of diversion of direct discharges of raw sewage to the upper harbour, consolidating the discharge points and providing Waste Water Treatment facilities as listed above have resulted in a decrease in the nitrogen trend within Lough Mahon (EPA, 2018; EPA, 2019). In addition the trend in winter median phosphorous levels between 2007 and 2017 in the River Lee Estuary Lower has showed a significant decrease in concentrations over this period. These trends indicate improvements in water quality within this transitional waterbody. Nevertheless the current status of the transitional waters of Lough Mahon as reported by the EPA for the period 2018 to 2020 is currently classified at eutrophic status, which is less than the good status required under the Water Framework Directive.

4.0 POTENTIAL IMPACTS

4.1 SURFACE WATER RUNOFF

The potential impacts that may arise as a result of the project relate to the discharge of contaminated surface water from the project site during the construction phase and operation phase to the River Bride and on downstream to the Lower River Lee and Lee Estuary section of the Cork Harbour SPA.

Construction phase activities will involve the demolition of the former hurley factory and outbuildings, site clearance, excavations for the proposed development footprint to accommodate buildings, paved area and services including attenuaton tanks. Bicycle paths will also be provided. A new constructed stream will be installed as part of the construction works to connect an underground surface water drainage pipe outfall (that will be installed under dry

acidic grassland and marsh fritillary habitat via horizontal directional drilling) to the Glenamought River to the north.

Earthworks associated with the construction phase of the project will denude surfaces and have the potential to generate silt-laden surface water runoff from the project site. These activities will have the potential to generate polluted surface waters on site. The discharge of such water to the Glenamought River will have the potential to perturb water quality in this river, the condition of which is already undermined by pollution. In addition, potentially contaminating materials such as oils, fuels, lubricants, other construction related solutions and cement-based products will be used on site during the construction phase and the accidental emission of such material via surface water runoff to the Glenamought River and downstream to the River Bride and the River Lee Estuary and the Cork Harbour SPA will have the potential to contribute to ongoing water quality perturbations within the estuary.

During the operation phase surface water generated at the project site will discharge via the proposed surface water pathway to the River Lee estuary to the north of the project site and will be conveyed downstream to where the River Lee Estuary section of the Cork Harbour SPA is located. The potential will exist for surface water runoff from car parking areas to be contaminated in the event of fuel leaks or accidental spills. While the pollution risk from residential parking areas is considered to be low (as per CIRIA C753 Simple Index Approach) any untreated discharge of contaminated surface water runoff from the project site to the River Bride will have the potential to contribute to water quality issues along this watercourse and downstream within the Lower Lee estuary and could contribute to existing pressures to water quality within the River Lee Estuary section of the SPA.

While it is noted that the uncontrolled release of contaminated surface drainage waters to the River Lee Estuary is likely to be rapidly diluted and distributed within the River Bride, Lower River Lee and the tidal waterbody of the River Lee Estuary, any deposition of contaminants such as hydrocarbons or cement material to intertidal habitats downstream along the River Lee estuary could result in the contamination of benthic fauna and epifauna which function as a prey resource of the wetland bird species of the Cork Harbour SPA. The toxic effect of such contaminants, particularly hydrocarbons, on feeding, growth, development and reproduction are known to cascade and bioaccumulate throughout the food chain affecting benthic fauna, fish, birds and mammals (Ferrando, 2015).

The significance of the impact of the uncontrolled release of contaminants from the project site to the River Lee Estuary and intertidal habitats and associated fauna will depend upon the frequency of the release and the concentration of contaminating materials in surface water discharging from the site, as well as the existing baseline water quality conditions within the receiving watercourse. As noted above the existing baseline water quality conditions within the receiving River Bride and downstream along the Lower River Lee Estuary are already perturbed by pollution inputs. In a worst-case scenario the ongoing discharge of waters with high concentrations of contaminating substances could over time lead to the deposition of such contaminants in wetland intertidal habitats. Revitt et al. (2014) demonstrated the potential of car parking areas to result in a build-up of diffuse pollution loads on their surfaces with subsequent mobilization and direct discharge to receiving waters. In the absence of appropriate design safeguards (such as the inclusion of hydrocarbon interceptors) the discharge of such contaminated surface water from the project site during the operation phase could represent a source of ongoing contamination to surface drainage waters being discharged to the River Bride and on downstream to the Lower River Lee and the River Lee Estuary. Accidental spillages of contaminating materials during the construction phase and/or operation phase could also represent sources of acute pollution to the Glenamought River and River Bride with the transport of such contaminants downstream to the River Lee Estuary.

The exposure of estuarine fauna, including birds, to such contaminants can result in disturbance and stress effects. Upon detection of such contaminants wetland birds may simply move away from the affected area, with the potential to result in a decline in the distribution of bird species within the SPA. For sessile benthic fauna, upon which many of the wetland bird species of the SPA rely, there will be no potential for escape and their exposure to contaminants may result in biological changes designed to aid survival. In some cases these benthic species may acclimatise to contaminated conditions, while in others the contaminants may lead to mortality and changes in the population and community structure of intertidal wetland habitats. Such an effect would have the potential to undermine the conservation status of wetland habitats occurring downstream of the project site within the SPA.

4.2 WASTEWATER DISCHARGES

Wastewater generated at the project site during the operation phase will be treated at Carrigrennan WWTP and discharged to the Lough Mahon section of Cork Harbour. This section provides an examination of the potential for the wastewater generated at the project site

to combine with existing wastewater discharges from the WWTP and result negative impacts to the water quality of Cork Harbour with consequence negative impacts to the status of Cork Harbour SPA and Great Island Channel SAC.

The most recently available Annual Environmental Report (AER) for the Carrigrennan WWTP is for 2019. This AER reported compliance with the emission limit values (ELVs) for Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS) and pH. Previous AERs have also consistently reported compliance with the ELVs for these parameters. However, the 2019 AER and previous AERs have consistently reported exceedances in ELVs for Total Nitrogen and Total Phosphorous. These exceedances have arisen due to the WWTP not being designed for nutrient removal. The scale of non-compliance over previous years is greater for Total N compared to Total P. For Total N the annual mean is 2-2.5 times higher than then ELV, while for Total P, the annual mean is below the ELV, but compliance failures have been reported in specific years due to a number of individual samples exceeding the ELV. The 2017 AER states that "the EPA have identified that the limiting nutrient in the receiving waters is total phosphorus" and that "it is expected that the ELV for total nitrogen will be amended in the licence" (Irish Water, 2017)[2]. Notwithstanding the non-compliances for nutrients reported in AERs for the WWTP, monitoring results indicate that the discharges do not have a negative impact on the water quality in Lough Mahon or on the Water Framework Directive status of the receiving waters (Irish Water, 2017, 2018, 2019).

Furthermore it is noted that the wastewater generated by the project will result in an imperceptible increase in the organic loading of the Carrigrennan WWTP and it has been confirmed by Irish Water that there is sufficient capacity to adequately treat the additional wastewater generated by the project. As such the project will represent a miniscule and negligible increase in the level of nutrient discharged to Lough Mahon and will therefore not

[2] In addition the 2017 AER Report also notes that plans are in place as part of the Irish Water 2017 – 2021 Investment Plan to upgrade the Carrigrennan WWTP with tertiary treatment and nutrient removal facilities.

have the potential to result in a perceptible change to the nutrient levels of waters within the Cork Harbour SPA and the Great Island Channel SAC.

In light of the above it can be concluded that the discharge of wastewater generated at the project site to the Carrigrennan WWTP will not have the potential to combine with the existing effluent from the WWTP to result in negative impacts to water quality in the harbour or negatively affect the conservation status of the Cork Harbour SPA and the Great Island Channel SAC.

4.3 IN-COMBINATION EFFECTS

The potential exists for the project to overlap with other construction projects within the vicinity of the project site. Other projects include the planning application reference no. 184633 within the IDA lands to the south of the project site. This project sought the retention of existing lamp standards in the carpark of the Flextronics facility. This is a small-scale retention planning application that will not have the potential to combine with the proposed project to result in significant adverse cumulative effects to European Sites at a remote distance at Cork Harbour.

Planning permission was granted to Cork City Council under a Part 8 Planning Application for the carrying out of enabling infrastructural work at their landbank on the Old Whitechurch Road. The enabling infrastructural works have commenced at the time of writing and include the following:

- the under-grounding of overhead power and communications lines, which will require the removal of metal masts and wooden poles, and the erection of new 'line cable interface' masts:
- the creation of a new junction and improvements on the Old Whitechurch Rd and Old Mallow Rd;
- the provision of a spine access/trunk road including ducting for electricity, gas, Eir and Virgin Media;
- the provision of water, foul and surface water drainage services for Irish Water and the council;
- and connecting existing services to the site including works in the adjacent Kilbarry 110KB sub-station to facilitate the under-grounding of overhead cables.

Given that these enabling infrastructural works are currently underway it is considered highly unlikely that they will overlap with the construction phase of the current proposed project. Nevertheless in the event that the enabling works or other future construction works for the development of these Council lands overlap with the proposed project there will be potential, in the absence of appropriate safeguards, for cumulative negative impacts to the water quality of the Glenamought River and River Bride with downstream impacts to water quality as described in Section 4.1 above.

Other recent planning applications (approved and live) for projects further downstream along the hydrological pathway of the River Bride and the lower River Lee have also been identified during a review of the Cork City Council online planning portal (accessed on the 24th June 2022). Each of these projects have been subject to either Screening for Appropriate Assessment or a Natura Impact Statement which have found that (where required) construction phase practices and operational designs will be implemented that aim to avoid discharges of contaminated waters to the River Lee and Cork Harbour. Each of the assessments completed for these projects have found that project will not have the potential to combine with other projects to result in likely significant effects to European Sites. In light of this the current project will not have any potential to combine with these other projects downstream along the hydrological pathway to result in an additive cumulative impact to water quality within the River Lee estuary.

Individual development project within the Cork City agglomeration will together increase the volume of wastewater and associated nutrient loading being treated at the Carrigrennan WWTP. The ongoing development of the City and the associated increases in wastewater generated within the agglomeration has been considered at Plan level during the preparation and finalisation of the Cork City and County Development Plans. During the preparation of the Cork County Development Plan an examination of the potential for increased population targets and associated wastewater loading to negatively affect Cork Harbour was completed. The Development Plan states that the status of waters within Cork Harbour will not be compromised by the proposed population targets in the County Development Plan, if the proposed upgrades to the WWTPs at Midleton and Carrigtwohill are delivered in advance of allowing new development to proceed. Upgrades to the Carrigtwohill and Midleton WWTPs have been completed since the publication of the 2014 Development Plan and these upgrades have significantly reduced the nutrient loads entering the Great Island Channel SAC and Cork

Harbour SPA. In addition, and as noted in Section 3.4 above the continued provision of the Lower Harbour Main Drainage Scheme represents a significant investment in the Cork Area and will see the separation of storm and foul for the lower harbour towns of Cobh, Carrigaline, Ringaskiddy, Passage West, Monkstown and Crosshaven. The construction of a state of the art treatment facility at Shanbally (65,000PE) has already been completed and is now taking raw effluent from the towns of Carrigaline and Ringaskiddy. It is also noted that the Shanbally Plant uses a significant advancement in technology (The Nereda Process - advanced nutrient removal technology - Aerobic Granular Sludge (AGS)) resulting in capacity increases as well as extensive nitrogen removal. The Nereda treatment process will consistently produce high quality treated wastewater which can be safely discharged into sensitive environments (Cork County Council, 2020). In the meantime a new wastewater treatment plant for Whitegate/Aghada has recently received planning approval in August 2021 (see Planning Reference No. 206463). The provision of these key wastewater infrastructure elements surrounding the harbour will further reduce nutrient loads within the harbour. It is expected that these projects will be delivered in advance of the operation phase of the currently proposed project such that the overall nutrient loads entering the harbour will be significantly lower that current levels during the operation phase of the project.

With regard to the existing threats and pressures to the SPA and SAC as documented by the NPWS in their Natura 2000 Standard Data Return Forms and listed in Section 3.2.1 and 3.3.1 above it is noted that none of these threats and pressures are relevant to the project site. It is noted that urbanisation and human habituation is listed as a threat/pressure to the Great Island Channel SAC. However given the fact that the project will be located within the existing urban fabric of Cork City and will not result in any changes to land cover within the city and is located at a remote distance from this SAC there will be no potential for it to combine with this existing threat to result in cumulative negative impacts to the SAC.

4.4 DESCRIPTION OF HOW THE PROJECT COULD AFFECT KEY HABITATS & SPECIES

An NIS is required to assess the potential for impacts to the integrity of a European Site, with respect to the site's structure and function and its Conservation Objectives. The structural and functional elements of a European Site to maintain the favourable conservation status of qualifying features of interest are embedded into the list of detailed SSCOs for each of the site's

interest features. As such a European Sites' SSCOs represent the parameters against which a project's potential to adversely affect the integrity of a European Sites should be considered.

Table 4.1 lists the Conservation Objectives attributes and targets for each of special conservation interests of the Cork Harbour SPA and the qualifying features of interest of the Great Island Channel SAC and assesses the potential for the project to result in adverse effects to these attributes and targets. .

It is noted that the appraisal outlined in Table 4.1 has been completed without any regard to the mitigation measures that will be implemented as part of the project. These mitigation measures are considered later in Section 6 below.

Table 4.1: Consideration of Potential Impact to the Site-Specific Conservation Objectives for Features of Interest occurring within the Zone of Influence of the Project

Attribute No.	Attribute	Target	Consideration of likely significant effects
Cork Harbour SPA			
Special conservation interest bird species			
1	Population trend	Long term population trend stable or increasing	The discharge of inadequately treated storm water and/or wastewater to Cork Harbour and the sections of the Cork Harbour SPA occurring in the River Lee Estuary will have the potential to undermine water quality at these locations. Adverse effects to water quality at these locations, will in turn have the potential to undermine the habitats and the associated prey resource upon which the wetland bird species of the SPA rely. Such adverse effects could, over time, result in a decline in the long-term population trend supported by the sections of the SPA surrounding the project site and discharge locations. For reasons outlined in 4.2 and 4.3 above wastewater discharges from the project will not have the potential to result in negative effects that could undermine the achievement of targets for this attribute.
2	Distribution	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent geese, Oystercatcher,	For reasons outlined for Attribute No. 1 and in Section 4.1 above the discharge of inadequately treated and contaminated storm water will have the potential to undermine the targets for this attribute.

		Black-tailed Godwit, Dunlin and Redshank other than that occurring from natural patterns of variation	
Great Island Channel SAC			
Mudflats			
3	Habitat area	The permanent habitat area is stable or increasing, subject to natural processes.	The discharge of inadequately treated and contaminated storm water to this habitat will not have the potential to undermine its extent within the SAC.
4	Community distribution	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex.	The discharge of inadequately treated and contaminated storm water to this habitat could contribute to water quality pressures within Cork Harbour and result in changes to the community of infauna supported by this habitat.
Saltmarsh			
5	Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession.	The discharge of inadequately treated and contaminated storm water to this habitat could result in changes to the vegetation community of this habitat, resulting over time in a decrease in the extent of this habitat.

6	Habitat distribution	No decline or change in habitat distribution, subject to natural processes.	For reasons outlined for Attribute No. 5 above the discharge of inadequately treated and contaminated storm water to this habitat could result in a decrease in the distribution of this habitat.
7	Physical structure: sediment supply	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	The storm water effluent from the project site will not have the potential to result in changes to this attribute. Any sediment discharged with inadequately treated storm water will settle in the harbour prior to be conveyed to areas supporting this habitat.
8	Physical structure: creeks and pans	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	The discharges associated with the project will not have the potential to result in changes to the physical structure of this habitat. These discharges will be mixed within the harbour and will not have the potential to change the hydrological regimes, such as flows etc, that underpin the physical structure of this habitat.
9	Physical structure: flooding regime	Maintain natural tidal regime	The discharges associated with the project will not have the potential to alter the natural tidal regime of Cork Harbour.
10	Vegetation structure: zonation	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	For reasons outlined for Attribute No. 5 above the discharge of inadequately treated and contaminated storm water to this habitat could result in a changes in the vegetation zonation.
11	Vegetation structure: vegetation height	Maintain structural variation within sward	For reasons outlined for Attribute No. 5 above the discharge of inadequately treated and contaminated storm water to this habitat could result in a changes in the vegetation community of this habitat, which in turn could result in changes in vegetation height.
12	Vegetation structure: vegetation cover	Maintain more than 90% area outside creeks vegetated	For reasons outlined for Attribute No. 5 above the discharge of inadequately treated and contaminated storm water to this habitat could result in a change in the nature of the vegetation cover of this habitat.

13	Vegetation composition: typical species and sub-communities	Maintain range of sub-communities with typical species listed in SMP	For reasons outlined for Attribute No. 5 above the discharge of inadequately treated and contaminated storm water to this habitat could result in a decrease in the abundant of typical vegetation of this habitat.

5.0 A DESCRIPTION OF HOW THE INTEGRITY OF THE SITE IS LIKELY TO BE AFFECTED BY THE PROJECT

EU Guidelines (2001) recommend as part of a Stage 2 Appropriate Assessment that a checklist of site integrity is carried out (see Table 5.1). This aids in establishing the nature of potential adverse effects to the integrity of the European Sites, as defined by the conservation objectives of special conservation interests occurring within the sphere of influence of the project.

Table 5.1: Checklist of Site Integrity

Conservation Objectives	
Does the Project have the potential to:	
Cause delays in progress towards achieving the conservation objectives of the site	Yes. In the absence of mitigation the project will have the potential to contribute to water quality perturbations downstream at the Cork Harbour SPA and the Great Island Channel SAC and undermine the status of qualifying habitats and their communities. Such effects will also have the potential to undermine the status of foraging habitat for special conservation interest bird species of the Cork Harbour SPA.
Interrupt progress towards achieving the conservation objectives of the site	Yes. See response to first question above.
Disrupt those factors that help to maintain the favourable conditions of the site	Yes. See response to first question above.
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site.	Yes. See response to first question above.
cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Yes. See response to first question above.
change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	Yes. The discharge of potentially contaminated surface water from the project site to qualifying habitats and their intertidal communities could contribute to a localised effect to the keystone fauna communities occurring downstream of the project.
interfere with predicted or expected natural changes to the site (such as water dynamics or chemical	Yes. The discharge of potentially contaminated surface water from

composition)?	the project site could result in a decrease in the diversity of key fauna communities supported by mudflat and Atlantic saltmarsh habitats.
reduce the area of key habitats?	Yes. The prolonged discharge of potentially contaminated surface water runoff from the project site to the Cork Harbour SPA and Great Island Channel SAC could contribute to a reduction in the extent of key communities supported by wetland qualifying habitats, which would in turn result in loss of mudflat and Atlantic saltmarsh in favourable conservation status. Such effects will also have the potential to undermine the status of foraging habitat for special conservation interest bird species of the SPA
reduce the population of key species?	Yes. See response to questions above.
change the balance between key species?	Yes. The prolonged discharge of potentially contaminated surface water runoff from the project site to wetland qualifying habitats could result in a reduction in the diversity of fauna communities that characterise the key communities supported by these habitats.
reduce diversity of the site?	Yes. See response to the question above.
result in fragmentation?	No.
result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	Yes. Any prolonged discharge of polluted surface water runoff from the project site to wetland qualifying habitats will have the potential to result in the reduction of key communities supported by these habitats.

6.0 A DESCRIPTION AND EVALUATION OF MITIGATION MEASURE

Targeted mitigation measures are provided to safeguard against the potential effects of the project to the water quality of the River Lee estuary and Cork Harbour during the construction phase and operation phase of the project. The measures to be implemented to protect the water quality downstream at the SAC and SPA are outlined in the following sub-sections.

6.1 ECOLOGICAL CLERK OF WORKS

An Ecological Clerk of Works (ECoW) as well as a Project Landscape Architect will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of baseline ecological surveys, pre-construction surveys and construction phase supervision.

The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the Construction Environmental Management Plan (CEMP) and Natura Impact Statement are implemented in full.

The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors, and for the purposes of protecting water quality and European Sites downstream The ECow will ensure that these sensitivities and their hydrological relationship with the Glenamought River is highlighted at the outset of the construction phase contract. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity and water quality protection related mitigation measures.

The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works.

Where necessary the ECoW will liaise with relevant authorities such as Cork County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity.

As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the Natura Impact Statement and/or the CEMP prepared for the planning application for the proposed development.

6.2 MEASURES TO PROTECT SURFACE WATER QUALITY

6.2.1 Construction Phase

6.2.1.1 Best Practice

The construction phase of the project will adhere to best practice guidance, particularly the CIRIA guidance document C532 Control of water pollution from construction sites. The construction approach will also adhere to the requirements set out in the Inland Fisheries Ireland guidance document *Requirements for the Protection of Fisheries Habitat during Construction and Development Works and Development Sites*.

During construction key requirements for control of chemical pollution risk will include:

- Measures will be put in place during the construction phase to collect, attenuate, settle and treat surface water runoff prior to discharge from the site. These measures will include features outlined in the Construction Management Plan that has been provided under separate cover as part of the planning application documentation. .

- The construction phase footprint will be well buffered from the project site, being located over 100m back from the Glenamought River at its nearest point to the river, while the proposed bicycle trail will be c. 60m back from the river.

- Storage – all equipment, materials and chemicals will be stored a minimum distance of 25m away from any existing surface drains within the project site. Chemical, fuel and oil stores will be sited on impervious bases and within a secured bund of 110% of the storage capacity, within the lay down area.

- The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall also be tested and demonstrated.

- All fuel oil fill areas will have an appropriate spill apron and spill kits will be provided on site.

- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface waterbody.

- Maintenance – maintenance to construction plant will not be permitted on site, unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance;

- Concrete - Wet concrete operations will be carried out in dry conditions. Runoff from wastewaters or contaminated surface water runoff will be directed to construction phase surface water drainage system to be installed on site;

- Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.

6.2.1.2 Construction Phase Surface Water Management

Surface water management measurers will be implemented to minimise, intercept, treat, disperse and dilute surface water generate at and surrounding the construction phase footprint of the project.

The main element of the construction phase surface water management design will be to minimise the volume of "dirty" water requiring treatment. This will be achieved by intercepting "clean" surface water runoff upgradient of the construction footprint before it drains into it and ensuring that the clean water is separated from the surface water generated within the construction footprint. The clean water will be directed to a buffered outfall that will allow the water to disperse over ground across vegetation where it will dilute through contact with clean water runoff from other lands outside the construction footprint.

In order to collect "dirty" water generated within the construction footprint a series of temporary construction phase surface swales will be installed within and bounding the construction footprint as necessary. The swales will be installed as the first item of the

construction works prior to vegetation clearance. The swales will be fitted with check dams will be installed at regular intervals within the swales. The check dams will be provided to reduce flows and erosion in the swale and to filter sediment from the water conveyed in the swale. Settlement build up on the upstream side of the check dams will be monitored and cleaned during the construction stage when necessary. The number and location of check dams will be dependent on the slope, flow and volume of water.

The surface water will be conveyed along the swales to a settlement pond/tank where it will be allowed to settle. The settled water will be discharged from the settlement pond/tank to a final buffered outfall swale which will discharge the treated surface water over a vegetated area where it will disperse and dilute with clean surface water arising from outside the construction footprint.

It addition to the above and given the slopes to the north of the project site that descend to the River Bride and silt fence will be installed along the northern boundary of the project site. The silt fence will be installed as per the silt fence specifications detailed in Section 18.6.12 of the CIRIA guidance document "Control of Water Pollution from Linear Construction Projects, Technical Guidance (C648)". The geotextile/fabric membrane will be buried in a trench (measuring 100mm X 100mm) to ensure that water does not flow under the silt curtain barrier.

The implementation of these surface water management measures, along with the best practice measures described in Section 6.1.1.1 above, will ensure that the project does not result in the discharge of untreated contaminated surface water during the construction phase.

6.2.1.3 Measures to Protect Water Quality during the Installation of the New Constructed Stream

The proposed new constructed stream will be constructed in the following sequence to avoid/minimise the potential for disturbance to the Glenamought River and the potential for the loss of silt from the newly constructed channel to river.

The new constructed stream channel will be excavated to within 2m of the Glenamought River. The bankside at the Glenamought River will be retained and remain in place during the excavation of the new stream channel alignment. A temporary silt fence will be installed at the end of the excavated constructed stream alignment at the "upstream" side of the remaining 2m retained bankside buffer. The silt fence will be installed in accordance with CIRIA guidelines.

The angle of connection of the new constructed stream channel to the Glenamought river will face downstream. This will contribute to maintaining current flow rates along the river.

The new constructed stream channel bed will be finished with a natural sand, stone and cobble bed. Larger boulders will be places along the channel to ensure that the finished bed material is retained in the channel and does not become washed away. Given that flows along the new constructed channel will be retained to low rates, at greenfield runoff rates, the potential for bed material to become washed away will be low. The provision of meander sections along sloping ground will also limit the potential for washout of bed material. In order to further maintain the integrity of the natural bed material to be provided along the stream boulders will be placed along the channel to further retard flows and any potential for wash out of bed material.

The bank side will be consolidated with vegetation that will include native hydrophilous species, tolerant of drying out. It is noted that the new stream channel is likely to dry out during extended periods of dry weather when surface water runoff from the proposed development footprint is low or absent.

Once the bed is installed and the bankside is vegetated the new stream will be connected to the Glenamought through the removal of the final 2m section of bankside. Boulder rip-rap will be installed at the connection point to ensure that the confluence between the new constructed stream and the river is maintained. Once these steps are completed the silt fence installed along the new constructed stream channel will be removed.

The timing of works for the final connection of the new constructed stream to the Glenamought River will coincide with the open season for instream works.

A final method statement will be required to be prepared by the site contractor prior to the commencement of any works for the new stream channel and the connection to the Glenamought River. The method statement will be required to incorporate the above measures as part of the approach to the installation of the new stream channel.

The contractor will be required to liaise with Inland Fisheries Ireland (IFI) and the method statement of the new stream works will be provide to the IFI. The works will be implemented

only where the IFI have indicated their satisfaction with the proposed approach to the works as set out in the method statement.

6.2.2 Operation Phase

6.2.2.1 Surface Water Management System

Surface water generated at the project site during the operation phase will be discharged through a Class 1 bypass oil interceptor designed in accordance with BS EN 852:2. An attenuation tank, sized to cater for a 100-year storm event with a 10% climate change allowance, will be provided downstream of the interceptor. Discharges from the attenuation tank will be limited to greenfield runoff rates. Discharge of treated surface water to ground will also take place downstream of the attenuation tank.

The attenuation tank will be regularly maintained throughout the operation phase to ensure that it continues to function as intended.

The provision of these design features will ensure that surface water emitted from the project site during the operation phase is adequately treated for hydrocarbons and will eliminate any risk of polluted surface water being discharged from the project site during operation.

A green roof is proposed for the creche building, which covers a total area of 472m². The green roof will include a drainage mat which will provide a minimum of 5mm of interception storage per 1m², allowing for a total interception storage volume of 1.51m³.

Permeable paving is proposed throughout the development, for a total area of 2,050m². The drainage pipe within the gravel bed for these areas will be set at 50mm above the bed formation giving (assumed 30% voids) interception stage equivalent to 15mm storage depth. Total interception volume provided in the permeable paving equals 30.75m³.

Tree pits/bioretention areas are proposed throughout the development, for a total area of 1,820m². The drainage pipe within the gravel bed for these areas will be set at 50mm above the bed formation giving (assumed 30% voids) interception stage equivalent to 15mm storage depth. The total interception volume provided is 27.30 m³.

6.3 SPOIL DISPOSAL

6.3.1 Pre-Construction Site Testing

Site investigations indicate that no industrial activity has been undertaken in the past and that the material to be removed off site will in general be described as inert. The site investigations will be completed prior to the commencement of construction and will include testing of the underlying materials for the presence of contamination.

Environmental soils testing will be undertaken during the site investigation process. In order to determine the quantity of water-soluble compounds present in waste/soils that may leach into the groundwater. 10:1 CEN Leachate testing will be undertaken with the results compared to those as set-out in the EU Council Decision 2003/33/EC.

Based on the site history as established above it is anticipated that the material to be removed off site will in general be described as inert, however, the site investigation process will establish the classification of the material.

It is proposed that all excavated material will be removed from the site to an appropriately licenced facility. Soil for disposal from the site are classified as waste and must comply with waste management legislation. The relevant legislation is the EU Council Decision 2003/33/EC which has been implemented in all member states and sets out the criteria for the acceptance of waste at Landfills. Limit values for the acceptance of inert, non-hazardous and hazardous waste are set out in sections 2.1, 2.3 & 2.4 of the EU Council Decision 2003/33/EC respectively.

Final certification for all materials removed off site will require to be provided by the main contractor on completion of the excavation works.

6.4 EVALUATION OF MITIGATION MEASURES

The mitigation measures and environmental safeguards outlined above for the construction phase of the project are taken from established best practice guidelines that have been successfully implemented for a wide range of project-level infrastructural developments. These measures have undergone extensive and rigorous monitoring for their effectiveness at

development sites where they have previously been applied to ensure adverse environmental impacts are avoided.

It is further noted that the range of mitigation measures outlined in this NIS and the associated EIAR to avoid perturbations to water quality and thereby avoid disturbance to protected fauna supported by the River Lee have been successfully implemented for a range of other development projects adjacent to the lower River Lee. Examples of these projects downstream of the current project within Cork City include One Albert Quay, Navigation Square, Elysian Development, Half Moon St, St. Patrick Street and Beasley Street Projects.

The results of this monitoring and the recommendation of these measures as standard best practice guidelines is based upon their high degree of success in ensuring negative environmental impacts are avoided.

The best practice guidance that have informed the mitigation measures and environmental safeguards proposed in this NIS and that will be adhered to throughout the construction and operation of the proposed development include:

- The Good Practice Guidance notes proposed by EA/SEPA/EHS:
- PPG 1: Understanding your environmental responsibilities - good environmental practices
- GPP 2: Above ground oil storage tanks
- PPG 3: Use and design of oil separators in surface water drainage systems
- GPP 5: Works and maintenance in or near water
- PPG 6: Working at construction and demolition sites
- PPG 7: Safe storage - The safe operation of refuelling facilities
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 19: Vehicles: Service and Repair
- GPP 21: Pollution incident response planning
- GPP 22: Dealing with spills
- GPP 26 Safe storage - drums and intermediate bulk containers
  PPG 27: Installation, decommissioning and removal of underground storage tanks
- CIRIA Environmental Good Practice on Site.
- CIRIA Control of Water Pollution from Construction Sites. Technical Guidance C648.

- CIRIA SuDS Manual Technical Guidance C697.
- Development on Unstable Land. Department of Environment (DOE), UK.

7.0 CONCLUSION

This NS presents an analysis of the potential for the project to result in adverse impacts to the Cork Harbour SPA and Great Island Channel SAC. An evaluation of the potential impact of discharges of surface drainage waters and operation phase wastewater has been completed.

During the evaluation of potential impacts associated with the discharge of surface drainage waters it was found that, in the absence of mitigation measures, the potential will exist for contaminants to be released from the project site to the Lower River Lee and for negative impacts to intertidal habitats and wetland bird species downstream. A range of mitigation measures have been prescribed in this NIS that aim to avoid the discharge of contaminated surface drainage waters from the project site during the operation phase. These mitigation measures have been evaluated and reference has been made to their successful implementation for other similar development projects in the vicinity of the project site and the River Lee within Cork City. It has been concluded that, provide all mitigation measures that aim to avoid the discharge of contaminated surface drainage waters are implemented, the potential for this impact to occur will be eliminated and associated adverse impacts to the Cork Harbour SPA will not arise.

The evaluation of potential impacts associated with the discharge of wastewater from the project to the lower River Lee has found that the project will not have the potential to combine with the existing wastewater loads to the Carrigrennan WWTP to result in potential adverse impacts to the conservation objectives of the Great Island Channel SAC or the Cork Harbour SPA.

Based upon the information provided in this NIS, it is the considered view of the authors of this NIS that it can be concluded by An Bord Pleanála that the project will not, alone or in-combination with other plans or projects, result in significant adverse effects to the integrity and conservation status of European Sites in view of their Conservation Objectives and on the basis of best scientific evidence and there is no reasonable scientific doubt as to that conclusion.

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APPENDIX 1: SCREENING REPORT FOR APPROPRIATE ASSESSMENT

Cork GAA Lands

Old Whitechurch Road

Kilbarry, Co. Cork

Screening Report for Appropriate Assessment

Doherty Environmental Consultants Ltd.

23rd October 2021

Corjk GAA Lands

Old Whitechurch Road

Kilbarry, Cork

Screening Report for Appropriate Assessment

Document Stage	Document Version	Prepared by
Final	1	Pat Doherty MSc, MCIEEM

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1.0 INTRODUCTION

Doherty Environmental Consultants (DEC) Ltd. has been commissioned by Cork County GAA Board to undertake a Screening Report in support of an Appropriate Assessment (AA), under Article 6 of the EU Habitats Directive, for a proposed Strategic housing Development (SHD) at Old Whitechurch Road, Kilbarry, Cork (see Figure 1.1 for the location of project site and Figure 1.2 for a current aerial view of the project site).

This Screening Report for Appropriate Assessment forms Stage 1 of the Habitats Directive Assessment process and is being undertaken in order to comply with the requirements of the Habitats Directive Article 6(3). The function of this Screening Report is to determine if it can or cannot be excluded, on the basis of objective information, that the project, individually or in combination with other plans or projects, will have a significant effect on a European Site. This Screening Report has been prepared to provide information to the competent authority to assist them in their determination as to whether a Stage 2 Appropriate Assessment is required for the project.

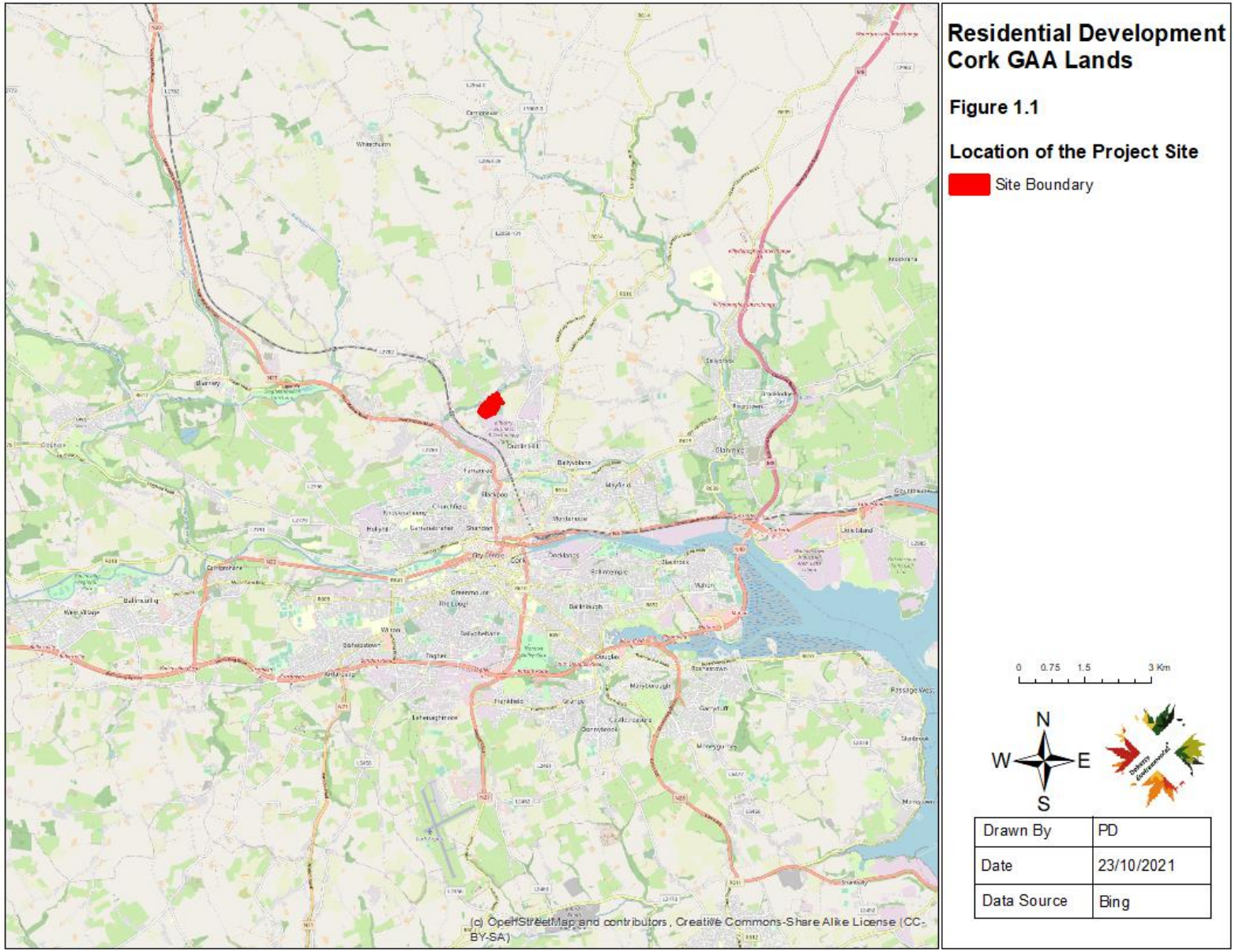
1.1 LEGISLATIVE CONTEXT

This Screening Report for Appropriate Assessment is being prepared in order to enable the competent authority to comply with Article 6(3) of Council Directive 92/43/EEC (The Habitats Directive). It is prepared to assess whether or not the project alone or in combination with other plans and projects is likely to have a significant effect on any European Site in view of best scientific knowledge and in view of the conservation objectives of the European Sites and specifically on the habitats and species for which the sites have been designated.

1.1.1 Requirement for an Assessment under Article 6 of the Habitats Directive

According to Regulation 42(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015, the competent Authority has a duty to:

- Determine whether the proposed Project is directly connected to or necessary for the management of one of more European Sites; and, if not, [LSEP]


Residential Development
Cork GAA Lands
Figure 1.1
Location of the Project Site
Site Boundary
0 0.75 1.5 3 Km
N
W
E
S
Drawn By PD
Date 23/10/2021
Data Source Bing
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)


Residential Development
Cork GAA Lands
Figure 1.2
Aerial View of the Project Site
Site Boundary
0 0.0275 0.055 0.11 Km
N
W
E
S
Drawn By PD
Date 23/10/2021
Data Source Bing

- Determine if the Project, either individually or in combination with other plans or projects, would be likely to have a significant effect on the Eurpoean Site(s) in view of best scientific knowledge and the Conservation Objectives of the site(s).

This Report contains information to support a Screening for Appropriate Assessment and is intended to provide information that assists the competent authority when assessing and addressing all issues regarding the construction and operation of the Project and to allow the competent authority to comply with the Habitats Directive. Article 6(3) of the Habitats Directive defines the requirements for assessment of projects and plans for which likely significant effects on European Sites may arise. The European Communities (Birds and Natural Habitats) Regulations, 2011 – 2015 (the Habitats Regulations) transpose into Irish law Directive 2009/147/EC (the Birds Directive) and Council Directive 92/43/EEC (the Habitats Directive) together which list habitats and species that are of international importance for conservation and require protection. The Habitats Regulations requires competent authorities, to carry out a Screening for Appropriate Assessment of plans and projects that, alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site's conservation objectives. This requirement is transposed into Irish Law by Part 5 of the Habitats Regulations and Part XAB of the Planning and Development Act, 2000 (as amended).

1.2 SCREENING METHODOLOGY

This Screening Report has been prepared in order to comply with the legislative requirements outlined in Section 1.1 above and aims to establish whether or not the proposed project, alone or in combination with other plans or projects, would be likely to have significant effects on European Sites in view of best scientific knowledge and the Site's conservation objectives. In this context "likely" means a risk or possibility of effects occurring that **cannot** be ruled out based on objective information and "significant" means an effect that would undermine the conservation objectives of the European sites, either alone or in-combination with other plans and projects (Office of the Planning Regulator (OPR), 2021) .

The nature of the likely interactions between the Plan and the Conservation Objectives of European Sites will depend upon the:

- the ecological characteristics of the species or habitat, including their structure, function, conservation status and sensitivity to change; *and/or*

- the character, magnitude, duration, consequences and probability of the impacts arising from land use activities associated with the plan, in combination with other plans and projects.

This Screening Report for Appropriate Assessment has been undertaken with reference to respective National and European guidance documents: Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (DEHLG 2010) and *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC; Office of the Planning Regulator – OPR Practice Note PN01: Appropriate Assessment Screening for Development Management*, and recent European and National case law. The following guidance documents were also of relevance during the preparation of this Screening Report:

- A guide for competent authorities. Environment and Heritage Service, Sept 2002. Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010). DEHLG.

- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/42/EEC. European Commission (2001).

- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC. European commission (2018).

The EC (2001) guidelines outline the stages involved in undertaking a Screening Report for Appropriate Assessment for projects. The methodology adopted during the preparation of this Screening Report is informed by these guidelines and was undertaken in the following stages:

1. Describe the project and determine whether it is necessary for the conservation management of European Sites;

2. Identify European Sites that could be influenced by the project;

3. Where European Sites are identified as occurring within the zone of influence of the project identify potential effects arising from the project and screen the potential for such effects to negatively affect European Sites identified under Point 2 above; and

4. Identify other plans or projects that, in combination with the project, have the potential to affect European Sites.

2.0 PROJECT DESCRIPTION

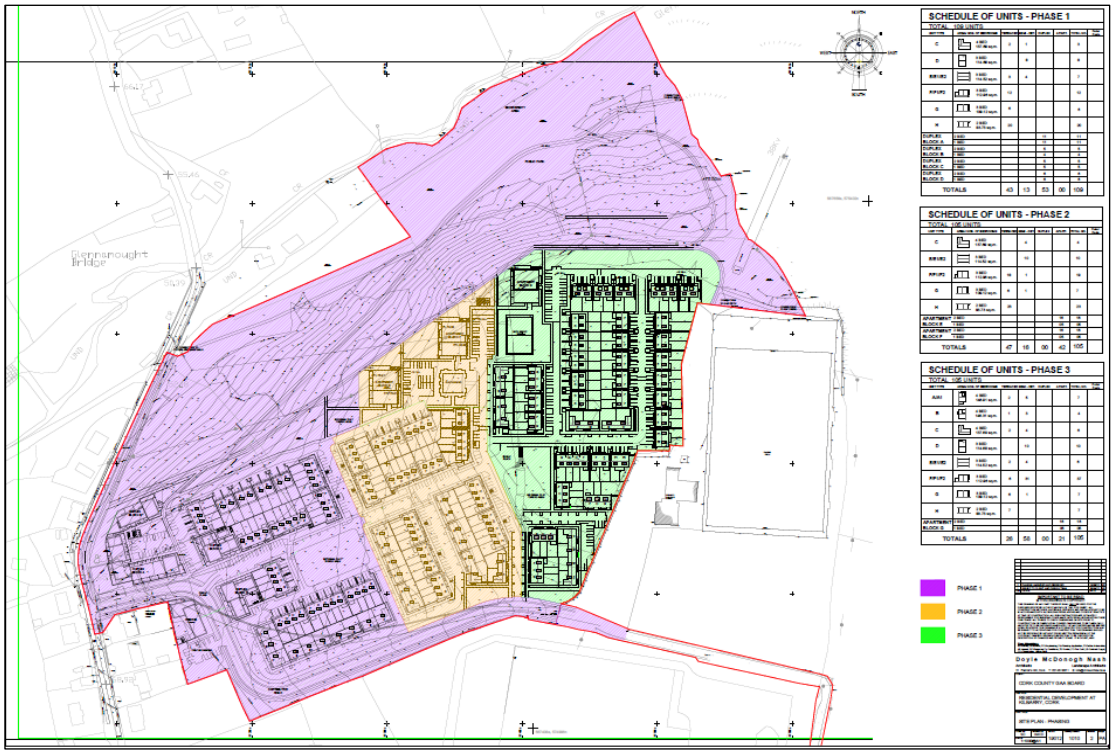
The proposed development will consist of a strategic housing development of 319no. residential dwellings comprising of 85no. semi-detached units (comprising of 17no. 4-bed units, 62no. 3-bed units and 6no. 2-bed units), 118no. terraced units (comprising of 8no. 4-bed units, 42no. 3-bed units and 68no. 2-bed units), 53no. duplex units (comprising of 26no. 1-bed units, 24no. 2-bed units and 2no. 3-bed units) and 63no. apartments (in 3no. part 4 storey and part 5-storey blocks and comprising 15no. 1-bed units and 48no. 2-bed units). The development also includes the provision of a crèche facility (519sqm) and a riverside amenity park to the north and northeast of the site. The proposed total gross floor area is 33,738.70sqm.

The proposed development will also consist of the demolition of a disused hurley manufacturing factory and associated out buildings, the removal and replacement of the southern and eastern boundary treatments, as well the creation of formalised walking paths to replace the informal walking paths located to the north of the site, a new through road from the proposed site access on the Old Whitechurch Road to Delaney's GAA Grounds and accessing the Upper Dublin Hill Road, with associated new boundary treatments at Delaney's GAA club, all associated ancillary site development and hard and soft landscaping works, to include the provision of private, communal and public open space, waste storage areas, bicycle and car parking, including EV and disabled parking, ESB substations, groundworks, foul drainage works, stormwater drainage proposals including directional drilling for the stormwater outfall, water supply proposals, public lighting, and all new boundary treatments.

Figure 2.1: Proposed Development (DMNA Architects)

The construction of the proposed development will be completed in three phases, with the first phase of 109 units serviceable without the requirement for infrastructure upgrades outside of the site by Irish Water. The second and third phases of the development will include approximately 105 units in each phase, subject to final detailed agreement with the Local Authority and utility providers.

Figure 2.2: Proposed Phasing Plan (DMNA Architects)



2.1.1 Proposed Phasing

It is estimated that the proposed phases will take 36 months to complete, with approximately 12 months construction for each of three phases. A Construction and Environmental Management Plan prepared by JB Barry Consulting Engineers outlining the process is included with the planning application and provided under separate cover as part of the planning application documentation.

Proposed roads, houses, apartments and the creche will be developed as close to existing ground levels as is possible. However, given the relatively steep existing topography and the need to achieve reasonable longitudinal gradients along roads and Part M access into residential units and the creche, it will be necessary to excavate and fill across the site to achieve acceptable levels. The design of the development will balance the extent of cut and fill, in so far as practically achievable, to ensure that there is not a significant surplus or deficit of material required.

Prior to any Phase 1 construction works being carried out, the proposed development will initially involve some site clearance, the demolition of existing, disused commercial buildings and stone houses structures and earthworks in order to clear and grade the site to accommodate the construction of all associated engineering works and subsequently the building foundations.

Development will commence at the western side of the site adjoining the Old Whitechurch Road and move across to the site's eastern side and the boundary with Delaney's GAA Club.

Phase 1

Phase 1 of the proposed development is to comprise the construction of 109no. residential units at the western side of the site, adjoining the Old Whitechurch Road. These units are the comprise:

3no. Type C 4-bed dwellings, each 137.69sqm in area

8no. Type D 3-bed dwellings, each 114.68sqm in area

7no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area

12no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area

6 no. Type G 3-bed dwellings, each 109.12sqm in area

20no. Type H 2-bed dwellings, each 83.73sqm in area

4no. duplex blocks comprising

Block A: 11no. 1-bed units and 11no. 2-bed units

Block B: 4no. 1-bed units and 5no. 2-bed units

Block C: 5no. 1-bed units and 5no. 2-bed units

Block D: 6no. 1-bed units and 6no. 2-bed units

The phase will include the construction of the east-west distributor roadway along the site's southern boundary. This phase will also see the construction of the community creche and associated parking adjacent the roadway.

This phase also incorporates the development of a public park to the north of the main area of the proposed development footprint. While the park terrain here is too severe to accommodate active play in terms of games, it is proposed to provide walking and bicycle routes in excess of 2kms. mown turf open space areas for passive recreation are to be provided where the slope condition is least severe and where more severely sloped, it is proposed to accommodate a range of woodland and open meadows with long and short grass management interspersed with parkland specimen tree planting to keep the landscape sufficiently open to view.

Phase 2

Phase 2 comprises the central area of the site and is to comprise the construction of 105no. residential units. These units are the comprise:

4no. Type C 4-bed dwellings, each 137.69sqm in area

10no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area

19no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area

7 no. Type G 3-bed dwellings, each 109.12sqm in area

23no. Type H 2-bed dwellings, each 83.73sqm in area

2no. apartment blocks comprising

Block E: 5no. 1-bed units and 16no. 2-bed units

Block F: 5no. 1-bed units and 16no. 2-bed units

Phase 3

Phase 3 comprises the central area of the site and is to comprise the construction of 105no. residential units. These units are the comprise:

7no. A/A1 4-bed dwellings, each 146.91sqm in area

4no. Type B 4-bed dwellings, each 146.31sqm in area

6no. Type C 4-bed dwellings, each 137.69sqm in area

10no. Type D 3-bed dwellings, each 114.68sqm in area

6no. Types E/E1/E2 3-bed dwellings, each 114.52sqm in area

37no. Type F/F1/F2 3-bed dwellings, each 112.96sqm in area

7 no. Type G 3-bed dwellings, each 109.12sqm in area

7no. Type H 2-bed dwellings, each 83.73sqm in area

1no. apartment block comprising

Block G: 5no. 1-bed units and 16no. 2-bed units

2.1.2 Key Development Statistics

A detailed floorspace schedule is set out in the Housing Quality Assessment prepared by DMNA Architects and submitted with the planning application. The principal development statistics are as follows:

Table 2.1: Key Development Statistics

Development Statistic	Proposed Development
Site Area	15.52ha
Gross Demolition Area	695sqm
No. Residential Units	319 No. residential units, to include: • 85 no. semi detached • 118 no. terraced • 53 no. duplex units • 63 no. apartments
Gross Floor Area	33,738.70m^2 to include: • 33,199.70m^2 residential • 539m^2 creche and substations
Building Height	House Types A/A1/B – 3 Storeys House Types C/C1/D/E/E1/E2/F/F1/F2/G/H/J – 2 Storeys Duplex Blocks A/B/C/D – 3 Storeys Apartment Blocks E/F/G – 5 Storeys Creche – 2 Storeys
Resident Support Facilities	Creche – 519 m^2
Resident External Amenity Space	Total Open Space Provision on overall lands – 7.051ha (45%) Total Active Open Space on overall lands – 2.777ha (18%) Active Open Space within developable area 1.22ha (14%)
Part V	64no. units, as follows: • 8no. Type F/FI/F2 Terrace Units • 2no. Type F/FI/F2 Semi-Detached Units • 2no. Type G Terrace Units • 10no. Type H Terrace Units • 32no. 2-bed Apartments • 10no. 1-bed Apartments
Plot Ratio	0.41
Site Coverage	17%
Residential Density	38.77 units/ha on developable area
Aspect	100% of Duplex Units benefit from dual aspect 81% of apartments benefit from dual aspect
Cycle Spaces	124no. cycle spaces
Motorbike Spaces	12no. parking spaces
Car Spaces	534no. parking spaces
Substations (4no.)	20m^2 (in total)

2.1.3 Design Approach

The following design objectives have informed the design process of the proposed scheme

Creation of a high-quality living environment for residents and enhancement of the social, environmental, and visual quality of the area;

Design of the layout to discourage anti-social behaviour, particularly by ensuring that the development overlook all access, parking and public open areas;

Promoting the concepts of enclosure, the clear separation of public/ private realm and permeability as the means to achieve a high-quality residential environment; and

Maximise amenity and energy efficiency through climate sensitive design that takes account of orientation and typography, and the retention of existing site features of merit.

The overall approach to the design of the proposed development is as follows:

The design layout responds to the site's topographical context, and to on-site constraints and potentials. The development proposes a new access from the Old Whitechurch Road north of the existing houses bounding the site. This distributor road is then proposed along the southern boundary of the site to link through towards the Delaney's GAA club lands to the east and along with the landscaped edge to the south of it creates a buffer between the existing industrial estate and the proposed housing development.

Throughout the scheme, appropriate responses are made to the nature of specific boundary conditions. The development is designed with housing generally backing onto the existing boundary with the Delaney's GAA club lands, but to then look out over the existing open space zoned lands to the north and towards the distributor road to the south of the site. The open space zoned lands are proposed as a new public park, with significant pedestrian and cycleways to link to both the east and west to create a large riverside amenity. To ensure overlooking of this space and to a strong urban edge 3 apartment buildings are proposed along the boundary of the residential areas and the public park. These apartment step down a full level, in order to address

the level change along this interface and to create a linear usable open space area immediately adjacent to the residential development within the public park.

The design's overall form, architecture & landscaping respond suitably to the location creating a sense of place and the development positively contributes to the character and identity of the neighbourhood.

The site is located within an existing urban environment on the northern fringe of Cork City. A number of new connections are proposed from the site to neighbouring facilities and infrastructure. A new distributor road with footpath and cycleway facilities is proposed along the southern section of the site linking the old Whitechurch Road to the Delaney's GAA lands to the east. In addition to this cycleway heading west to east two other cycleways are included heading north south through the development. The first links the public plaza adjacent to the creche to the public park along the northern fringe of the site. The second cycle route links from the distributor road at its eastern end within the site through the scheme linking the second plaza space with the various recreation facilities included within the development such as the playground, kick about are and the external gym and finally onto the cycle routes within the public park. These route and the development's layout with cycleways and pedestrian connections from it into the development will also make it easy for a bus to serve the scheme

Within the scheme there is a range of public, communal and private amenity spaces and facilities for children of different ages, parents and the elderly. This ranges from the large public park with amenity walks, to a number of usable open space areas within the development which are designed for informal play to the recreation facilities located along the pedestrian and cycleway which runs north south through the development linking the distributor road to the public park through the development. These facilities include a public plaza designed to be suitable to external performances to a playground area for younger children, a kick about area for older children and an outdoor gym for adults and older people. Areas defined as public open space will also be clearly defined, accessible and open to all.

The houses, apartments and duplex units are designed and arranged on site to maximise solar gain. Houses are arranged to minimise the number of north facing rear gardens, and specific wide fronted house types have been designed so that all the main habitable rooms facing south maximise solar gain

Landscaped areas are designed to provide amenity and biodiversity. A range of amenity areas are provided which vary from the large public park to smaller pocket parks within the development. A biodiversity area is proposed to the northern section of the landholding along the Glenamought River[1] which will not be accessible to the public. The scheme will also incorporate sustainable urban drainage systems.

The layout makes the most of the opportunities presented the existing sloped ground of the river valley in the northern portion of the site through the creation of a new public park which is overlooked by the development and interconnected with it. In this regard the proposed apartment buildings are crucial, providing an urban edge, whilst also ensuring overlooking of a significant portion of the open space and also successfully exploiting views out of the site to the north and west.

In accordance with the Design Manual for Urban Streets and Roads, the design has a clear hierarchy of roads within the scheme. From the proposed distributor road to the south to the two linked local access roads within the scheme down to minor access roads and finally shared surfaces and homezones a clear hierarchy is designed throughout the scheme. Road widths, turning radii, surface finishes and detailing will differentiate each road type. Furthermore, dedicated pedestrian and cycling facilities are provided throughout the scheme linking each part of the development and also linking the development to neighbouring sites and facilities.

The streets are designed as places instead of roads for cars, helping to create a hierarchy of space with less busy routes having surfaces shared by pedestrians, cyclists and drivers, with traffic speeds controlled by design and layout rather than by speed humps

All public open space is overlooked by surrounding homes so that this amenity is owned by the residents and safe to use. A number of pocket parks are located throughout the development and these are designed so that they are overlooked by the adjacent houses. In this case shown

[1] Note that the Glenamought River is also known as and referred to as the River Bride

below the roads around the open space are pedestrian priority share spaces which ensures that the open space can be accessed safely from the houses surrounding it.

The public realm is considered as a usable integrated element in the design of the development. For example, in the public plaza space shown below is located along the north-south combined pedestrian and cycle route which traverses the site connecting the distributor road to the public park. The plaza incorporates the road adjacent to make it a pedestrian friendly space while also assisting in reducing traffic speeds at a key junction in the overall development.

The layout has been designed with car parking generally on-street or within easy reach of the home's front door. In all situations parked cars are overlooked by houses, pedestrians and traffic. In excess of 75% of units are provided with communal parking on the basis of 1 space per apartment and duplex unit, 1.5 spaces per 2 bed house and 2 spaces per house for houses of 3 and 4 bedrooms. This will ensure that the efficiency of parking spaces is maximised and allow for the accommodation of visitors without the need to provide additional dedicated spaces. Materials used for parking areas are of similar quality to the rest of the development and communal spaces are designed with significant landscaping to reduce the visual impact of parked cars on the development

Adequate secure facilities are also provided for bicycle storage, with all duplex units having shared covered bicycle parking areas provide either in open space areas of in communal semi-public courtyards to the rear of the units. All apartments have an internal bike storage area incorporated into the basement level where there are steps in level. Communal motorbike parking is provided within shared parking areas to all duplexes and apartments in accordance with the Cork City Development Plan.

Bin stores for the terraced houses have been designed within the public areas to be close to the houses they serve and small in nature so that they can be accommodated within landscaped areas and adequately screened. Bin stores for the apartments are incorporated internally into the basement floor level, where there are steps in section. For the duplex units, bin stores are generally either located on the property where possible through the creation of small private amenity areas at ground level. Where bin stores are shared they are located in sheltered areas within larger landscape public spaces such as between blocks A and B, or in the rear semi private courtyard of blocks C and D.

2.2 SURFACE WATER MANAGEMENT

During the operation phase it is proposed to discharge surface water from the project site to the Glenamought River along the northern boundary of the project site. It is proposed to convey the surface water to the river via an open drain. The open drain will be designed to form part of the landscape plan for the project and will ensure that flows are managed and erosion of the open drain does not occur.

The proposed surface water management design will include a storm drainage pipe network, attenuation storage structures and several SuDS features which will aid the reduction of runoff volumes by slowing surface water flows, providing the opportunity for evapotranspiration and providing the opportunity for infiltration to ground. Both the interception and attenuation storage requirements of GDSDS will be sufficiently met.

An assessment of the potential SuDS measures that could be incorporated within the site was conducted using the SuDS Manual, CIRIA 753 as guidance. The following SuDS features have been identified as applicable and will be provided within the proposed scheme:

- Green Roof: will be provided on the creche building. The green roof will be an extensive type with sedum planting at the surface with a drainage layer beneath. The drainage layer will convey flows to discharge locations. It is not proposed to restrict the discharges from the roofs.

- Permeable Paving: will be provided for all parking spaces. Permeable paving will be a Type B as per SuDS Manual, CIRIA 753, a combination of infiltration and piped drainage.

- Tree Pits/Bioretention Planters: will be provided in every feasible location where there is a proposed tree or planter. The tree pits will contain engineered soil filled tree boxes with drainage pipes beneath to link trees together and tie in with the proposed surface water sewer. The bioretention planters will consist of a shallow landscaped depression at the surface with a drainage layer beneath.

- StormTech Attenuation Tank: will be provided at the natural low points for final storage of runoff volumes before discharging to the existing river at a controlled rate.

- Attenuation will be provided by StormTech attenuation chambers which will cater for the 100-year storm event with a 10% climate change allowance added. The proposed surface water network has been split into two catchments, A and B. the outflow from Catchment A will tie in with the Catchment B network. The final storage location, Catchment B, is located in the largely undeveloped northern area of the site. The route from the final storage area to the final discharge location at the Glenamought River/River Bride must pass a protected butterfly habitat and navigate a steep decline to the river edge.

- To combat these issues, it is proposed to utilise directional drilling along the outfall route beneath the butterfly habitat at a depth of approximately 3.4m – 4.2m below existing ground. The underground drilling will be continued beyond the habitat area, as far as the transition from underground to open channel at manhole S77. From this point it is proposed, due to steepness of the gradient to the discharge location, to create a meandering open drain with check dams. The open drain will be designed in consultation with the landscape architect and ecologists to ensure that the open drain is considerate of the existing landscape and will ensure that flows are managed, and erosion of the open drain does not occur. It is proposed to discharge surface water from the final storage area at a maximum rate of Qbar (26.26 l/s).

In relation to electricity, 4no. new substations will be installed as part of the proposed development. This will have enough capacity for the proposed development, including the proposed EV charging points. A connection will be made to the existing network where there is sufficient capacity for the proposed development.

In relation to telecommunications and broadband, the developer is required to place an order with a telecoms provider for new fixed phone lines and fixed broadband connections.

2.3 FOUL WATER DRAINAGE

Wastewater collection within the proposed development will be via a network of gravity sewers for ultimate discharge to Irish Water's wastewater network in Old Whitechurch Road immediately to the west of the site. The wastewater collection system will be designed and constructed in accordance with Irish Water's Code of Practice for Wastewater Infrastructure to ensure self-cleansing velocities will be achieved on all pipe runs. Following a Pre-Connection

Enquiry, Irish Water have issued a Confirmation of Feasibility (COF) that the site can be serviced by its wastewater infrastructure network.

3.0 DESCRIPTION OF THE SITE LOCATION

The land cover (as per Fossitt, 2000) at and surrounding the proposed development footprint within the project site is dominated by grassland habitats in the form of improved/semi improved grassland that has been traditionally subject to livestock grazing, scrub, areas of recolonising ground and made ground. Scrub occurs to the west of the developable area along with corrugated buildings. In the open space to the north of the developable area the ground slopes steeply to the north and a mix of unimproved grassland and established scrub and broadleaved woodland occur along the slopes. The grassland on the steep north facing slopes supports abundant Succisa pratensis and is known to support a population of marsh fritillary, a species listed on Annex 2 of the EU Habitats Directive.

The Glenamought River forms the northern boundary of the project site. The Glenamought River is located within the River Lee surface water catchment and the Kiln_SC_010 sub-catchment. The water quality of the section of the Glenamought River to the north of the project site is currently under review and has not been assigned by the EPA. The section of the River Bride a short distance downstream, beyond Glenamought Bridge has been assessed by the EPA and has been classified as an "At Risk" waterbody under the Water Framework Directive (Water Framework Directive). The remainder of the River Bride downstream to its confluence with the River Lee has been classified as "At Risk". Nutrients in the form of ortho-phosphates in particular have been identified as having a negative impact on the water quality of the River Bride downstream.

Site investigations have been completed at the project site. No groundwater was encountered during the investigation works. Some made ground was discovered to the east of the site, up to 4m in depth. In addition some shallow bedrock was discovered on the west of the site between 0.6m and 2.3m in depth. The made ground area comprises fill that was illegally dumped by others in 1999 without the knowledge or permission of Cork County GAA Board. The matter has been previously resolved by the Board. The filled areas has been sampled and tested and the material therein has been confirmed as being non-hazardous and benign. Given that this material has been in place for over 20 years it is intended to leave this material in place and while it will require specialised foundation solutions to be employed for structures developed

in this area it would not be sensible or practical to remove this material from the site at this stage.

4.0 IS THE PROJECT NECESSARY FOR THE CONSERVATION MANAGEMENT OF EUROPEAN SITES

The project has been described in Section 2 of this Screening Report and it is clear from the description provided that the project is not directly connected with or necessary for the future conservation management of any European Sites.

5.0 IDENTIFICATION OF EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE OF THE PROJECT

Current guidance informing the approach to screening for Appropriate Assessment defines the zone of influence of a proposed development as the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. It is recommended that this is established on a case-by-case basis using the Source-Pathway-Receptor (SPR) framework.

As a first step in identifying the European Sites that could be connected to the project via SPR pathways all European Sites occurring in the wider surrounding area were identified. As can be seen in Figures 5.1 two European Sites, comprising Cork Harbour SPA and Great Island Channel SAC, occur within the wider area surrounding the project site. All other European Sites are located at a remote distance from the project site and are not connected to it via any SPR pathways.

As the nearest European Site (Cork Harbour SPA) is located approximately 6km (as the crow flies) overland to the southeast, the project will not have the potential to result in direct impacts to European Sites. Thus, this Screening exercise focuses on investigating whether it can or cannot be excluded, on the basis of objective information, that the project will have the potential to result in indirect effects to European Sites or effect mobile species associated with European Sites beyond the boundaries of their designated conservation areas.

Using the SPR framework the project, as described in Section 2 of this Screening Report, represents the source of potential impacts to European Sites.

Potential impact pathways are restricted to hydrological pathways. The project will result in the discharge of surface water and wastewater to the River Lee and Cork Harbour and as such a hydrological pathway connects the project site to the Cork Harbour SPA and the Great Island Channel SAC.

No other pathways such as noise, visual or night time lighting disturbance or emissions to atmosphere will arise due to the distance of the project site from the nearest European Sites. Surveys completed at the project site during September 2020, October, November 2021, April, May and June 2022 have not identified the presence of special conservation interest bird species of the Cork Harbour SPA at the project site and wetland bird species associated with this SPA do not rely on the project site as a foraging or roosting habitat and the project site does not play a role in supporting over-wintering waterbird species. As such there is no mobile species pathway connecting the project site to the Cork Harbour SPA.

The receptors represent European Sites and their associated qualifying features of interest.

European Sites and their associated qualifying features are likely to occur in the zone of influence of the project only where hydrological pathways establish a link between the project and the European Site.

Table 5.1 provides an evaluation as to whether the European Sites in the wider area surrounding the project site occurs within its zone of influence. This determination has been undertaken based on whether or not there is a hydrological pathway linking the project site and the Cork Harbour European Sites.

Table 5.1: identification of European Sites within the Zone of Influence of the Project

European Sites	**Distance from Project Site**	**Hydrological Pathway**	**Do qualifying habitats occur within the zone of influence of the project.**	**Does the Project have the potential to interact with Qualifying Species**	**Do European Sites occur within the Projects Zone of Influence?**
Cork Harbour SPA	6km overland to the southeast or an estimated 9km downstream.	Yes a hydrological pathway connects the project site to this SPA. Surface water runoff generated at the project site during the construction phase and operation phase will be discharged to the River Bride, which in turn drains to the River Lee. A section of this SPA occurs along the lower River Lee. During the operation phase wastewater generated at the project site will be directed to the existing combined sewer network and will be conveyed to the Carrigrennan WWTP for	Yes. Qualifying wetland habitats of the SPA occur downstream of the project site along the Lee Estuary.	Yes. Special conservation interest bird species of the SPA (which are listed in Section 6 below) occur downstream of the project site along the Lower River Lee and estuary.	Yes. A hydrological pathway links the project to this European Site. The next step of this screening is to determine whether it can or cannot be ruled out, on the basis of objective information that this hydrological pathway has the potential to function as impact pathway that could result in significant indirect impacts to the

		treatment. The outfall of the Carrigrennan WWTP is located in Lough Mahon to this south of this SPA. The outfall location is buffered from the nearest point of the SPA by over 500m of transitional waters. However tidal flows may result in the movement of discharge effluent from the WWTP outfall into this SPA.			special conservation interest bird species and wetland habitats for the SPA.
Great Island Channel SAC	10.5km to the southeast.	Yes there is a hydrological pathway connecting the project site to this SAC. There is no direct hydrological pathway linking the construction phase and operation phase surface water runoff from the project site to this SAC. Hydrodynamic modelling of Cork Harbour has shown that the Great Island Channel is influenced by tidal flows with little influence on this area of the harbour by freshwater inputs from the River Lee (see T.J. O'Connor & Associates Consulting Engineers, 2009). Given the tidal dominance on	Yes. The qualifying habitats of this SAC are: • Mudflats and sandflats not covered by seawater at low tide [1140] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Tidal flows may result in the movement of discharge effluent from the WWTP outfall into this SAC.	No. No qualifying species are listed as qualifying features of interest for this SAC	Yes. There is potential for tidal movements of WWTP effluent discharge from the Carrigrennan WWTP outfall into this SAC. The next step of this screening is to determine whether it can or cannot be ruled out, on the basis of objective information, that the wastewater pathway potentially linking the project to this SAC could function as an impact

		hydrodynamics and water quality in the Great Island Channel, along with the imperceptible volumes of surface water generated at the project site during the construction and operation phases (relative to those occurring within the Lee Estuary and the harbour) it is concluded that no functional surface water hydrological pathway links the project site to this SAC. During the operation phase wastewater generated at the project site will be directed to the existing sewer network and will be conveyed to the Carrigrennan WWTP for treatment. The outfall of the Carrigrennan WWTP is located in Lough Mahon, approximately 500m to this south of this SAC. However tidal flows may result in the movement of discharge effluent from the WWTP outfall into this SAC.		pathway that could result in significant indirect impacts to the qualifying habitats of this SAC.

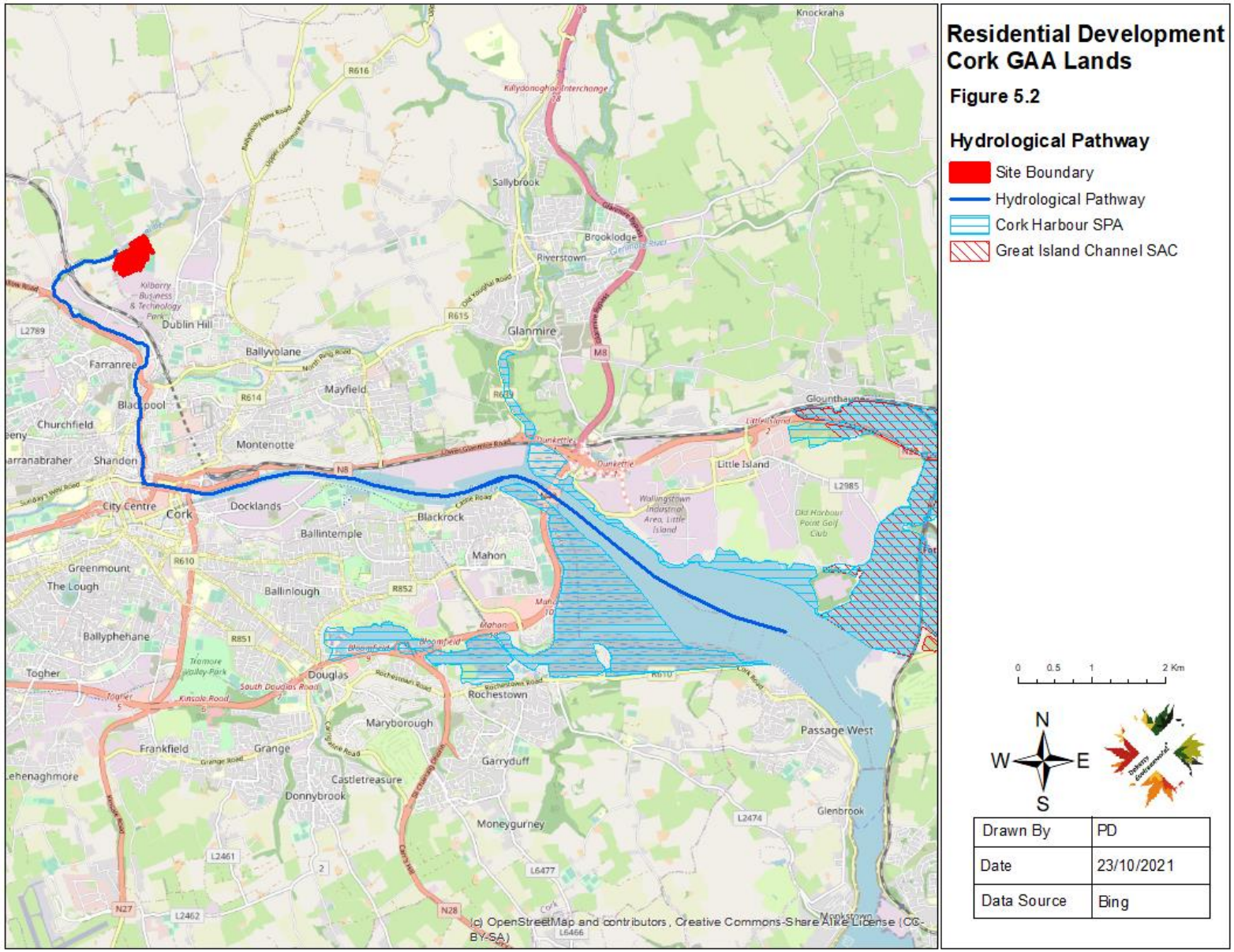

Residential Development
Cork GAA Lands
Figure 5.2
Hydrological Pathway
Site Boundary
Hydrological Pathway
Cork Harbour SPA
Great Island Channel SAC
0 0.5 1 2 Km
N
W
E
S
Drawn By PD
Date 23/10/2021
Data Source Bing
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)
Knockraha
Sallybrook
Brooklodge
Riverstown
Glanmire
Dublin Hill
Ballyvolane
Farranree
Mayfield
Blackpool
Churchfield
Montenotte
Shandon
City Centre
Cork
Docklands
Blackrock
Ballintemple
Mahon
Greenmount
The Lough
Ballinlough
Ballyphehane
Togher
Douglas
Rochestown
Maryborough
Frankfield
Grange
Castletreasure
Donnybrook
Garryduff
Moneygurney
Passage West
Glenbrook
Little Island
Glounthaune

Table 5.1 above examines the relationship between the project site and the European Sites occurring within the surrounding area. As noted within this table no European Sites occur in close proximity to the project site. The site is hydrologically linked to the Cork Harbour SPA (see Figure 5.2: Hydrological Pathway) and the Great Island Channel SAC (the latter via the potential for movements of wastewater generated by the project site and discharged from the Carrigrennan WWTP within the SAC and SPA). The next step of this Screening is to provide baseline information on the Cork Harbour SPA and the Great Island Channel SAC and to examine the potential for the hydrological pathways between the project site and the Cork Harbour SPA and the Great Island Channel SAC to function as potential impact pathways.

6.0 EUROPEAN SITE BASELINE

6.1 CORK HARBOUR SPA

Cork Harbour SPA is a large European Sites consisting of a number of discrete sections associated with river estuaries. The section relevant to the project site is that occurring along either bank of the River Lee Estuary. Other areas of the SPA are located in the outer River Lee estuary and Cork Harbour and due to the harbours hydrodynamics and specifically tidal influences are not considered to occur within the sphere of influence of the project.

The special conservation interests of Cork Harbour SPA include a list of 23 wetland bird species and wetland habitats.

The special conservation interest bird species (with EU Birds Directive Code No. in parenthesis) are as follows:

- Little Grebe (Tachybaptus ruficollis) [A004]
- Great Crested Grebe (Podiceps cristatus) [A005]
- Cormorant (Phalacrocorax carbo) [A017]
- Grey Heron (Ardea cinerea) [A028]
- Shelduck (Tadorna tadorna) [A048]
- Wigeon (Anas penelope) [A050]
- Teal (Anas crecca) [A052]
- Pintail (Anas acuta) [A054]

- Shoveler (Anas clypeata) [A056]
- Red-breasted Merganser (Mergus serrator) [A069]
- Oystercatcher (Haematopus ostralegus) [A130]
- Golden Plover (Pluvialis apricaria) [A140]
- Grey Plover (Pluvialis squatarola) [A141]
- Lapwing (Vanellus vanellus) [A142]
- Dunlin (Calidris alpina) [A149]
- Black-tailed Godwit (Limosa limosa) [A156]
- Bar-tailed Godwit (Limosa lapponica) [A157]
- Curlew (Numenius arquata) [A160]
- Redshank (Tringa totanus) [A162]
- Black-headed Gull (Chroicocephalus ridibundus) [A179]
- Common Gull (Larus canus) [A182]
- Lesser Black-backed Gull (Larus fuscus) [A183]
- Common Tern (Sterna hirundo) [A193]

The wetland habitats of the SPA include intertidal mudflats, saltmarshes and estuaries.

6.2 GREAT ISLAND CHANNEL SAC

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats

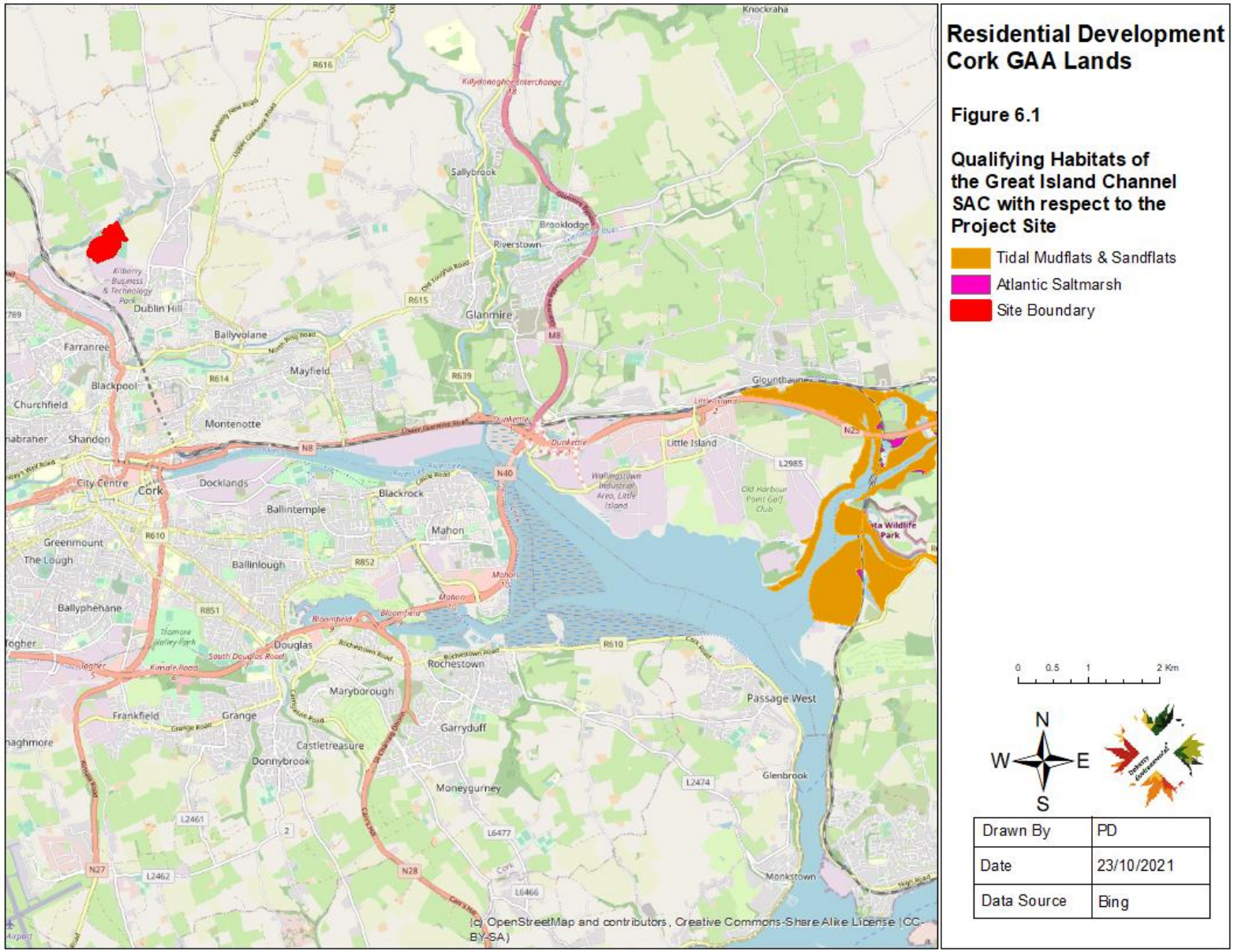
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. The location of these qualifying habitats of the SAC with respect to the project site are shown in Figure 6.1. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.


Residential Development
Cork GAA Lands
Figure 6.1
Qualifying Habitats of the Great Island Channel SAC with respect to the Project Site
Tidal Mudflats & Sandflats
Atlantic Saltmarsh
Site Boundary
0 0.5 1 2 Km
N
W
E
S
Drawn By PD
Date 23/10/2021
Data Source Bing
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)
Knockraha
Sallybrook
Brooklodge
Riverstown
Glanmire
Dublin Hill
Ballyvolane
Farranree
Blackpool
Churchfield
Mayfield
Montenotte
Shandon
City Centre
Cork
Docklands
Blackrock
Ballintemple
Mahon
Greenmount
The Lough
Ballinlough
Ballyphehane
Douglas
Rochestown
Maryborough
Frankfield
Grange
Garryduff
Castletreasure
Donnybrook
Moneygurney
Glenbrook
Passage West
Monkstown
Glounthaune
Little Island
Dunkettle
R616
R615
R614
R639
R610
R852
R851
N8
N40
N25
N27
N28
M8
L2985
L2474
L2461
L2462
L6477
L6466

6.3 CORK HARBOUR WATER QUALITY

Cork Harbour has a history of problems associated with water pollution and eutrophication (e.g. ERU, 1989). Up to the 1960's most of the urban and industrial developments took place in Cork City and its immediate environs, and sewage and other waste were discharged directly into the River Lee. In the late 1980's, sewers were installed to convey waste water to two outfalls on the quays. While this improved water quality status upstream, the Lee Estuary and Lough Mahon regularly suffered from problems of increased concentrations of organic matter (BOD), nutrient enrichment, faecal coliform bacteria and a decrease in dissolved oxygen levels. In addition to the Lee Estuary and Lough Mahon, the Owennacurra estuary below Midleton has also suffered with serious pollution in the past; again linked to sewage outfalls (ERU, 1989).

Water quality in the Upper Harbour was improved by the engineering works conducted under the Cork Main Drainage Scheme, which included the building of Carrigrennan WWTP (Wastewater Treatment Plant) at Little Island, Co. Cork. The plant treats wastewater from Cork City and surrounding areas in the County including the City Environs, Glanmire and the proposed new town at Monard. The plant was commissioned in 2004 with a design organic load capacity of 413,000 population equivalent and provides primary and secondary treatment. Treated wastewater from the plant is discharged through a 500m long outfall pipe to Cork Harbour at Lough Mahon. However, the design of the existing plant did not include for nutrient removal or disinfection and since the plant was commissioned the upper harbour has been designated as a sensitive area under the Urban Wastewater Treatment (Amendment) Regulations 2004 (SI 440/2004). Current discharges from the plant do not comply with these regulations with concentrations of total nitrogen and total Phosphorous exceeding the licenced emission limit values (ELVs), the causes of which have been attributed to the absence of Nitrogen and Phosphorous treatment at the wastewater treatment plant (Irish Water, 2020; Irish Water 2019). The EPA have identified that the limiting nutrient in the receiving waters is total phosphorus. It is expected that the ELV for total nitrogen will be amended in the licence. Discussions are ongoing between IW and EPA in this regard. ELVs contribute to the receiving water achieving the environmental quality standards set in the European Communities Environmental Objectives (Surface Water) Regulations 2009, (as amended), which are aimed at providing a high degree of protection to the receiving water body (Cork County Council, 2020). The 2019 Annual Environmental Review (AER) (Irish Water, 2020) notes that phosphorous removal will be provided at the wastewater treatment plant.

Several locations around the lower harbour currently have no treatment facilities at all (Cobh, Passage West/ Monkstown, Carrigaline, Crosshaven and Whitegate/Agahda). However the continued provision of the Lower Harbour Main Drainage Scheme represents a significant investment in the Cork Area and will see the separation of storm and foul for the lower harbour towns of Cobh, Carrigaline, Ringaskiddy, Passage West, Monkstown and Crosshaven. The construction of a state of the art treatment facility at Shanbally (65,000PE) has already been completed and is now taking raw effluent from the towns of Carrigaline and Ringaskiddy. It is also noted that the Shanbally Plant uses a significant advancement in technology (The Nereda Process - advanced nutrient removal technology - Aerobic Granular Sludge (AGS)) resulting in capacity increases as well as extensive nitrogen removal. The Nereda treatment process will consistently produce high quality treated wastewater which can be safely discharged into sensitive environments (Cork County Council, 2020). In the meantime a new wastewater treatment plant is currently proposed for Whitegate/Aghada.

The South Western River Basin District (SWRBD) River Basin Management Plan 2011 – 2015 covers the implementation of the Water Framework Directive (WFD) (2000/60/EEC) for the south-west coast of Ireland and covers Cork Harbour and its inflowing rivers and streams (SWRBD, 2010a).

In 2009 the water quality status of Cork Harbour was assessed as 'moderate' according to the South Western River Basin Transitional and Coastal Waters Action Programme (SWRBD, 2010b) and failed to meet the required standards as set by the Water Framework Directive. The contributing factors were below standard levels of dissolved inorganic nitrogen (DIN) and dissolved oxygen (DO) with waste water treatment plants (WWTP), combined sewer overflows and treatment plant overflows being the listed pressures.

However more recently there have been improvements in the water quality status of Cork Harbour, with the most recent assessment classifying the water quality status of the harbour as Good. The shift from 'Moderate' status in 2009 to 'Good' indicates that water quality in Cork Harbour has improved, primarily as a result of reduced levels of dissolved inorganic nitrogen (EPA, 2018) and the improvements brought about as a result of diversion of direct discharges of raw sewage to the upper harbour, consolidating the discharge points and providing secondary treatment within the Carrigrennan Waste Water Treatment plant.

Since 2007 a similar significant decrease in the levels of dissolved inorganic nitrogen in the Lough Mahon downstream have also been recorded (EPA, 2018; 2019). In addition the trend in winter median phosphorous levels between 2007 and 2017 in the River Lee Estuary Lower has showed a significant decrease in concentrations over this period. These trends indicate improvements in water quality within this transitional waterbody. Nevertheless the current status of the transitional waters of Lough Mahon as reported by the EPA for the period 2018 to 2020 is currently classified at eutrophic status, which is less than the good status required under the Water Framework Directive.

6.4 DOCUMENTED THREATS & PRESSURES

The NPWS have documented threats and pressures to the Cork Harbour SPA in their Natura 2000 Data Return Form for this SPA. The threats and pressures to this SPA have been ranked in terms of low, medium and high impacts. These threats and pressures and their associated impact rank are as follows:

- Nautical sports (medium impact);
- Shipping lanes (medium impact);
- Fertilisation (medium impact);
- Leisure fishing (medium impact);
- walking, horseriding and non-motorised vehicles (medium impact);
- Marine and Freshwater Aquaculture (high Impact);
- Industrial or commercial areas (high impact);
- Roads, motorways (high impact)
- Urbanised areas, human habitation (high impact);
- Port areas (high impact)

In addition to the threats and pressures listed above the Conservation Objectives Supporting Documentation (NPWS, 2014) for the Cork Harbour SPA has identified activities within or in the vicinity of the River Lee Estuary and the associated sub-sites that have the potential to result

in a disturbance effect to wetland bird species. The activities that have the potential to result in disturbance events to birds within these subsites are as follows:

1. Shipping channels;
2. Railway;
3. Power boating and water skiing; and
4. Walking, including dog walking.

The documented threats and pressures to the Great Island Channel SAC, as listed in its Natura 2000 Data Return Form are as follows:

- Grazing (medium impact);
- Non-native invasive species (medium impact);
- Reclamation of land from sea, estuary or marsh (high impact);
- Fertilisation (medium impact);
- Roads and motorways (high impact);
- Urbanised areas, human habitation (high impact);
- Marine and freshwater aquaculture (high impact); and
- Eutrophication (natural) (medium impact).

6.5 CONSERVATION OBJECTIVES

Site-specific Conservation Objectives for the Cork Harbour SPA and the Great Island Channel SAC have been published by the NPWS (NPWS, 2014a). The overall Conservation Objectives for the special conservation interest bird species of the Cork Harbour SPA is to maintain the favourable conservation status of bird species for which the SPA is designated. The favourable conservation status of bird species will be achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

The overall Conservation Objective for the qualifying features of interest of the Great Island Channel SAC is to maintain or restore the favourable conservation status of these features of interest. Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and;
- the conservation status of its typical species is favourable.

The site-specific Conservation Objectives for the Cork Harbour SPA and the Great Island Channel SAC aim to define the favourable conservation status for their special conservation interest bird species and qualifying habitats. The site-specific Conservation Objectives for these species and habitats occurring within the zone of influence of the project are outlined in Table 6.1 below.

Table 6.1: Site-Specific Conservation Objectives for Cork Harbour SPA Special Conservation Interest Species and the Great Island Channel SAC qualifying habitats

Attribute	Measure	Target	Notes
Cork Harbour SPA			
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Number and range of areas used by waterbirds	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent	Waterbird distribution from the 2011/2012 waterbird survey programme is discussed in part five of the conservation

		geese, Oystercatcher, Black-tailed Godwit, Dunlin and Redshank other than that occurring from natural patterns of variation	objectives supporting document.
Great Island Channel SAC			
Mudflats			
Habitat area		The permanent habitat area is stable or increasing, subject to natural processes.	Habitat area was estimated using as 723ha using OSi data
Community distribution		Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex. See map 4 of the conservation objectives publication (NPWS, 2014b).	Based on intertidal and subtidal surveys undertaken in 2006 (Aquafact, 2007) and 2011 (EcoServe, 2012; MERC, 2012). See marine supporting document for further information
Saltmarsh			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Two sub-sites that supported Atlantic salt meadow were mapped (1.30ha) and additional areas of potential saltmarsh (17.60ha) were identified from an examination of aerial

			photographs, giving a total estimated area of 18.90ha. Saltmarsh habitat has also been recorded at two other sub-sites within the SAC (Curtis and Sheehy Skeffington, 1998). NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.	Based on data from McCorry and Ryle (2009). Within the sites surveyed by the SMP, estuary type saltmarsh over a mud substrate is most common and ASM is the dominant saltmarsh habitat. NB further un-surveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Bawnard there is a seawall that was constructed in the 18th-19th centuries. At Carrigtohill the northern and eastern shorelines have been significantly modified by road construction. Part of the saltmarsh has also been infilled. See coastal habitats supporting document for further details

Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). The ASM at Carrigtohill is poorly developed, though some of the larger sections contain salt pans. The smaller sections, however, tend to be quite uniform in topography. The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on data from McCorry and Ryle (2009). At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). Zonations to Salicornia flats and intertidal mudflats occurs at Carrigtohil. At Bawnard, there is succession from saltmarsh to brackish saltmarsh and wet grassland as well as zonation to intertidal mudflats at the lower saltmarsh boundary. See coastal habitats supporting document for further details

Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Carrigatohil, the sward height is quite tall due to lack of grazing. At Bawnard only part of the site is grazed. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Some poaching was noted in places at Bawnard. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in SMP	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - Spartina anglica	Vegetation structure: negative indicator species - Spartina anglica	Vegetation structure: negative indicator species - Spartina anglica	Based on data from McCorry and Ryle (2009). Spartina occurs at both sub-sites in this SAC. See coastal habitats supporting document for further details

7.0 IN-COMBINATION EFFECTS

The potential exists for the project to overlap with other construction projects within the Bride and lower River Lee catchment. In the event of the discharge of pollutants from the project site

to the Glenamought River or River Bride downstream, the project will have the potential to combine with other approved projects in the surrounding area to result in negative impacts to the water quality of the River Bride and the lower River Lee, both of which drain to the Lee estuary, which in turn supports sections of the Cork Harbour SPA.

8.0 IDENTIFICATION OF LIKELY SIGNIFICANT EFFECTS

The potential environmental effects generated by the project with respect to European Sites relates to the potential for the project to result in negative impacts to water quality along the hydrological pathway that connects the project site to the Cork Harbour SPA During construction the project will have the potential to result in impacts to water quality within the River Bridge and downstream within the Lee.

Surface water generated during the construction phase will ultimately be discharged to the River Lee. Potentially contaminating materials, such as hydrocarbons, cement-base materials, other construction-related solutions and silt will occur on site during the construction phase and will have the potential to become entrained in and pollute surface drainage waters generated on site. This water will be discharged to the River Bride and on downstream to the River Lee. While it is acknowledged that the volume of surface drainage waters discharging from the project site to the Lower River Lee will be miniscule in the context of the receiving lower River Lee waterbody, the catchments that drain to the lower River Lee (i.e. four surface water sub-catchments drain to lower River Lee and the section of the Cork Harbour SPA occurring along it, with the project site footprint representing a miniscule fraction – 0.02% - of the land occurring within these catchments), and the tidal influence on this waterbody, in the absence of appropriate safeguards the potential will exist for the discharge of pollutants that could further perturb water quality. As noted in Section 3 and 6.3 above existing pressures to the water quality status of the River Bride and Lower River Lee have led to these waterbodies being classified as At Risk and Intermediate Status (i.e. less than good status) respectively. The discharge of polluted surface drainage waters from the project site to the Lower River Lee will have the potential to combine with these existing water quality pressures and exacerbate the ongoing perturbations to water quality.

While the uncontrolled release of contaminated surface drainage waters to the lower River Lee is likely to be rapidly diluted and distributed within this tidal waterbody any deposition of contaminants such as hydrocarbons or cement material to intertidal habitats downstream along

the River Lee estuary could result in the contamination of benthic fauna and epifauna which function as a prey resource of the wetland bird species of the Cork Harbour SPA. The toxic effect of such contaminants, particularly hydrocarbons, on feeding, growth, development and reproduction are known to cascade and bioaccumulate throughout the food chain affecting benthic fauna, fish, birds and mammals (Ferrando, 2015).

Given the potential for construction-related contaminants to contribute to existing pressures to the status of intertidal habitats upon which wetland bird species rely and notwithstanding the likelihood for dilution and distribution of such contaminants in the Lower River Lee, it is considered that, in the absence of appropriate safeguards, it cannot be objectively ruled out that the project will not have the potential to release such substances to the River Lee and that these substances will not have the potential to combine with other water quality pressures to undermine the status of wetland habitats downstream and within the River Lee estuary.

Wastewater will be generated during the operation phase of the project and this wastewater will be discharged from the Carrigrennan WWTP via its outfall to Lough Mahon within Cork Harbour. Given the presence of the Cork Harbour SPA and the Great Island Channel SAC within Cork Harbour another hydrological connection between the project site and these European Sites could be established as a result of the wastewater pathway for operation phase wastewater generated at the project site. While it is noted that the additional wastewater loading resulting from the operation phase of the project is likely to represent a miniscule fraction of the overall loading treated at Carrigrennan a high degree of conservatism and precaution has been applied for this Screening and it is considered that the potential for wastewater generated at the project site to result in negative impacts to the water quality within Lough Mahon with resultant negative indirect effects to the Cork Harbour SPA and the Great Island Channel SAC cannot be excluded at the screening stage.

9.0 SCREENING CONCLUSION

The proposed project has been screened for its potential to result in likely significant effects to surrounding European Sites. As this project site is located approximately 6km from the nearest European Sites, a Source-Pathway-Receiver model was used to identify potential impact pathways linking the project site to European Sites. The potential impact pathways identified were restricted to hydrological pathways.

Two European Sites, the Cork Harbour SPA and the Great Island Channel SAC were identified as occurring within the zone of influence of the project. This SPA is designated for its role in supporting 23 wetland bird species and wetland habitats. These bird species and the wetland habitats of the SPA, particularly estuaries and mudflats were also identified as occurring within the zone of influence of the project. The Great Island Channel SAC is designated for its role in supporting Atlantic Saltmarsh and Mudflat habitats. The reason for identifying these bird species and habitats within the zone of influence of the project was due to:

- the presence of a hydrological pathway linking the project site to the River Lee, which in turn drains to the Lee Estuary, which supports intertidal foraging areas and roosting sites used by special conservation interest bird species and

- the potential for wastewater discharges from the Carrigrennan WWTP outfall moving within the SPA and SAC.

In the absence of appropriate safeguards the project has been identified as having the potential to result in the discharge of contaminated surface drainage waters and wastewater to the River Bride and on downstream to the Lee Estuary and Cork Harbour. It has been found during this Screening, which has been completed with a high degree of conservatism and precaution that the potential for the release of contaminated surface drainage waters and wastewater to result in significant negative effects to the conservation objectives of the Cork Harbour SPA and the Great Island Channel SAC cannot be ruled out at the screening stage.

For the reasons outlined above it is the considered view of the authors of this Screening Report for Appropriate Assessment that the potential for likely significant effects to European Sites cannot be ruled out at the Screening stage and that an Appropriate Assessment of the project is required. Based on this conclusion a NIS has been prepared to inform the competent authority during its Appropriate Assessment of the project and its potential to result in adverse effects to the integrity of the Cork Harbour SPA and the Great Island Channel SAC, alone or in-combination with other plans or projects.

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