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Report in Support of Appropriate Assessment Screening

Proposed Great Connell Strategic Housing Development, Newbridge, Co. Kildare

O'Callaghan Moran & Associates

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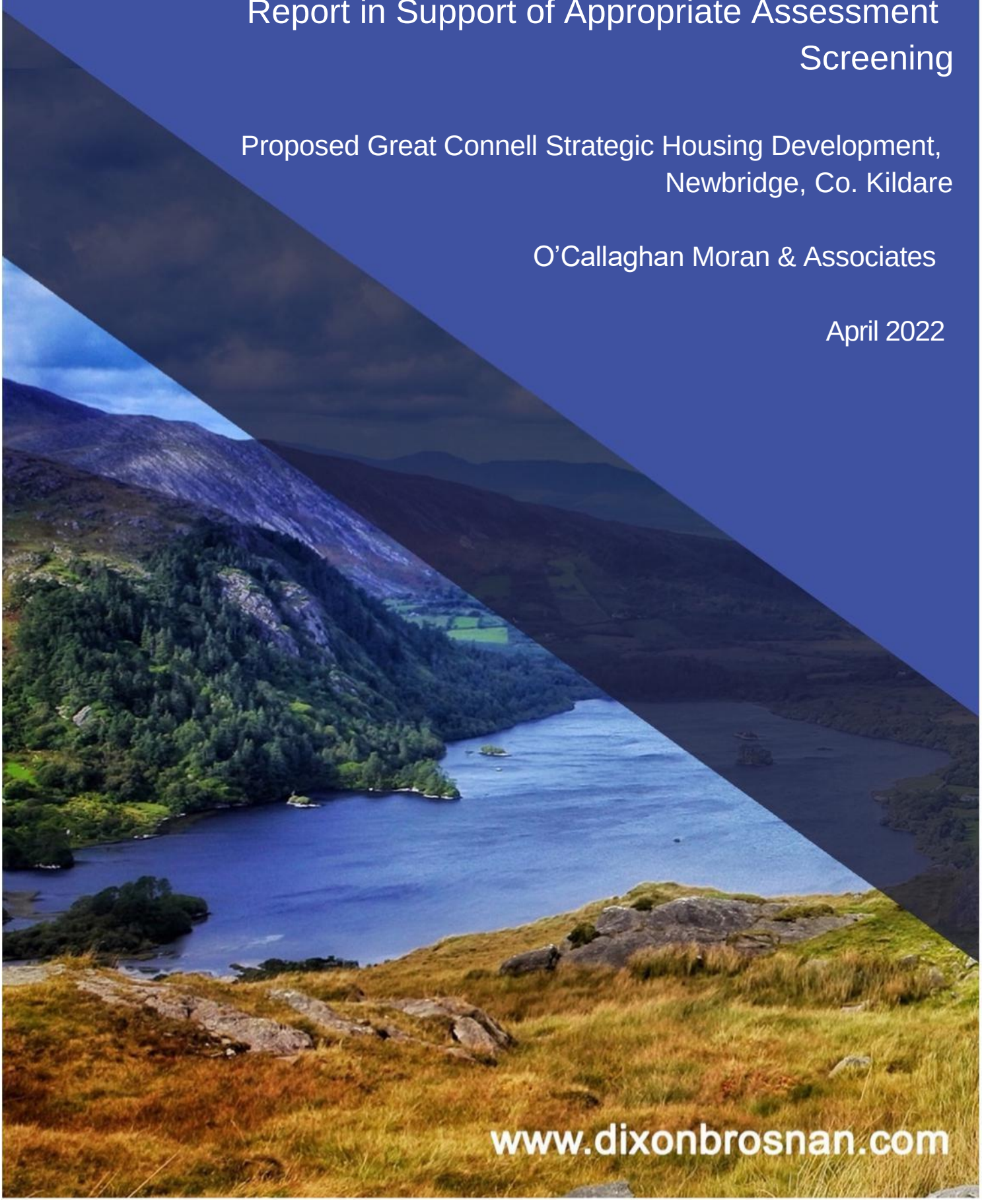

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Project	Report in Support of Appropriate Assessment Screening for Proposed Great Connell Strategic Housing Development, Newbridge, Co. Kildare	
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1. Introduction

1.1 Background

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on behalf of the applicant. It provides information on and assesses the potential for a proposed strategic housing development (SHD) at Great Connell, Newbridge, Co. Kildare, to impact on any Natura 2000 sites within its zone of influence. The information in this report should be read in conjunction with the planning application submitted to An Bord Pleanála (ABP) in connection with the proposed development.

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites and from these the conservation objectives of the site are derived. The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. As set out in Section 177U of the Planning and Development Act 2000 as amended, a screening for appropriate assessment of an application for consent for the proposed development must be carried out by the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on any European site. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

1.2 Aim of Report

The purpose of this report is to inform the AA process as required under the Habitats Directive (92/43/EEC) in instances where a plan or project may give rise to significant impacts on a Natura 2000 site. This report aims to inform the Appropriate Assessment process in determining whether the development, both alone and in combination with other plans or projects, are likely to have a significant impact on the Natura 2000 sites in the study area, in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

This report has been prepared with regard to the following guidance documents, where relevant.

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* (European Commission (EC), 2018);
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission (EC), 2001);
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC* (European Commission, (EC) 2007);
- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government, 2010 revision);
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10* (Department of Environment, Heritage and Local Government, 2010);
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive* (International Workshop on Assessment of Plans under the Habitats Directive, 2011);
- *Communication from the Commission on the precautionary principle. European Commission* (2000) and
- CJEU Case C 164/17 Edel Grace Peter Sweetman v An Bord Pleanála.

1.3 Authors of Report

This report was prepared by Carl Dixon MSc. (Ecological Monitoring), Sorcha Sheehy PhD (Ecology/Ornithology).

Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc. He has carried out ecological surveys and prepared AA/NIS reports for a range of projects.

Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant with over ten years' experience. She has worked on Screening/NIS's for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

2. Regulatory Context and Appropriate Assessment Procedure

2.1 Regulatory Context

The Habitats Directive (Council Directive 92/43/EEC on the *Conservation of Natural Habitats and of Wild Fauna and Flora*) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of these directives are transposed into Irish law through the European Communities (Birds and Natural Habitats Regulations; S.I. No. 477 of 2011).

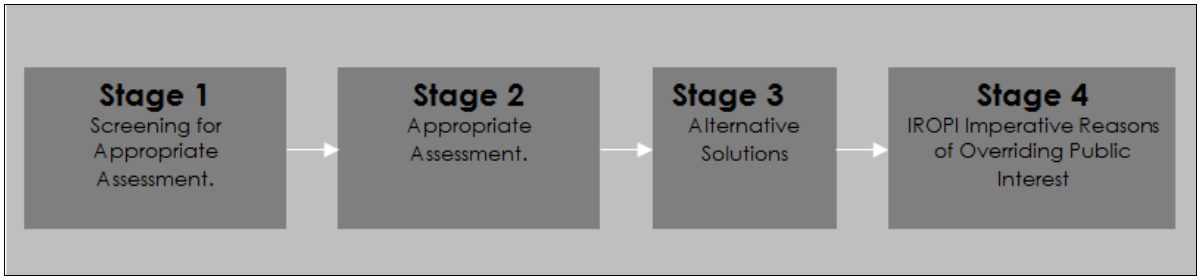
Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate sites, which form the Natura 2000 network.

Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter 'the Habitats Directive') requires that, any plan or project not directly connected with or necessary to the management of a designated site, but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. A competent authority (e.g. the EPA or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

The possibility of a significant effect on a designated or "European" site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications "Assessment of plans and projects significantly affecting Natura 2000 sites: methodological guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC" (2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft) Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

Stage One: Screening — the process which identifies any appreciable impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant;

Stage Two: Appropriate assessment — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent.

It is the responsibility of the competent authority, in this instance ABP, to make a decision on whether or not the proposed development should be approved, taking into consideration any potential impact upon any Natura 2000 site within its zone of influence.

3. Receiving Environment

3.1 Existing Site

The site is to the east of Newbridge Town Centre (**Figure 1**). It is accessed from the east from the Great Connell road, which forms the eastern boundary. It is bounded to the north-east by a residential development (Wellesley Manor) and to the north-west by an open drain that was formerly a meander channel of the River Liffey. A hedgerow forms the southern boundary. The south-western boundary is defined by a buffer zone on the western side of the River Liffey. The western boundary is not defined on the ground.

The proposed development is on the eastern outskirts of Newbridge, ca 1km from the Town Centre and main retail area. To the south and south-east are agricultural lands primarily used for tillage. To the east, across the Great Connell Road, are the Murphy Ireland Ltd offices and compound. To the north-east is Wellesley Manor, which has the closest residential dwellings to the development, with the houses in the south of the estate being approximately 10 m from the north-eastern development site boundary.

The Dr Pepper beverage manufacturing plant (formerly Lidl distribution centre) is ca 500m to the north-east. The Pfizer manufacturing complex, which is Europe's largest manufacturers of solid dose pharmaceuticals is ca 800m to the north. To the south-west, across the River Liffey, a 343 unit residential development is currently under construction. The Baroda Stud Farm is ca 500m to the south-east.

3.2 Proposed Development Site Description

The proposed development site covers an area of 27.64ha, most of which is used for tillage. The River Liffey flows through the southwestern corner of the site, with an area of treelines and woodland along its boundary. A drainage ditch at the centre of the site is connected to a drainage ditch on the northern boundary, which ultimately flows into the River Liffey to the west of the proposed development site.

3.3 Existing Services

3.3.1 Water Supply

There is an Irish Water 300mm watermain running along the Great Connell Road to the east of the site. This supplies the Wellesley Manor residential estate via a 100mm uPVC network.

3.3.2 Surface Water Drainage

Due to the topography it is not possible to drain the entire residential development site via one outfall. As such it is proposed to discharge via gravity to four new outlets on the existing ditch which passes through the north of the site as well as two new outlet to the River Liffey to the west.

The proposed section of Newbridge South Outer Orbital Relief Road (NSOORR) that will run through the site will have a separate drainage system. Due to level and vertical clearance constraints imposed by the existing 900mm diameter foul sewer traversing the site two outfalls are required.

Seven underground attenuation tanks with a combined capacity of 5,387m3, will serve the residential development, as shown on Drawing 192229-PUNCH-XX-XX-DR-C-0160. Two underground tanks (combined volume of 320m3) will serve the section of the NSOORR.

All of the tanks will be fitted with flow regulation devices designed to maintain the flow rates to the water courses at pre-development greenfield rates. Class 1 Bypass Hydrocarbon Separators will be located downstream of all of the attenuation tanks. The discharge points to the ditch and the river will be fitted with non-return valves to prevent water from the river surcharging up through the surface water drainage network.

In addition to the underground attenuation tanks, the following Sustainable Urban Drainage Systems (SuDs) are incorporated into the design:

- Permeable paving
- Swales/Bioswales
- Green Roofs
- Soakaways/Soak Pits
- Rainwater Harvesting

The drainage system design takes account effects of coincidental flooding and is in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) Volume 5 Guidance for combination flood events. Futher details on surface water drainage are included in **Appendix 2** drawings.

Figure 1. Proposed development site location | Source OSI

Figure 2. Proposed site layout | Source OFM

3.3.3 Foul Water Drainage

The network was designed using Causeway Flow software in accordance with Irish Water's Code of Practice for Wastewater Infrastructure and the Department of the Environment's Recommendations for Site Development Works for Housing Areas. The foul water loading was calculated in accordance with the Code of Practice for Wastewater Infrastructure, with a 10% allowance for infiltration

The existing 450mm foul sewer that runs across the site from south to north will be diverted to connect to the Upper Liffey Valley Sewerage Scheme (ULVS) existing 900 mm diameter sewer. Due to the site topography it was not feasible to provide a gravity connection to the ULVS sewer.

All foul water will be collected by gravity and brought to a foul water pumping station in the north of the site from where it will be pumped to the ULVS sewer, as shown on Drawing 192229-PUNCH-XX-XX-DR-C-0113 **(**Appendix 2**)**. The foul pumping station will deliver a peak flow to the ULVS sewer of 19.5l/s. It will include a 254m3 capacity emergency storage tank that will retain the foul water in the event of a breakdown.

PUNCH estimate the average daily discharge to the Irish Water foul sewer will be 280,355 litres when the development is complete. To reduce the water demand on the water supplies water conservation measures will be incorporated in the sanitary facilities throughout the development, e.g. dual flush toilets.

A Pre-Connection Enquiry Form was sent to Irish Water in relation to the proposed development, and Irish Water issued a Confirmation of Feasibility. The PUNCH proposed foul network proposals were then submitted to Irish Water for Design Vetting and Irish Water issued a Statement of Design Acceptance.

See **Appendix 2** Drawings for further detail on foul water drainage.

3.4 Description of Proposed Development

The proposed residential development provides for 569 residential dwellings and supporting commercial development in Great Connell, Newbridge. To facilitate the development it is necessary to demolish the existing structures on the site which comprise; 'Great Connell' a two-storey dwelling of 331.9 sqm with detached single storey garage and outhouses of 48 sqm; 'Valencia Lodge' a single storey dwelling of 135.6 sqm with a single storey garage of 17.8 sqm; two no. single storey sheds of 1,440 sqm and 595 sqm, and a three-sided shed of 54 sqm.

The proposed residential development comprises the construction of 569 no. new residential dwellings (325 no. houses and 244 no. apartments). There are 15 no. house types proposed, which in total provide 64 no. two-bed houses; 173 no. three-bed houses; and 88 no. four-bed houses (ranging in height from 2 to 3 storeys).

The 244 no. proposed apartments include 164 no. own-door units and 80 no. shared access apartments and comprise the following;

- Apartment Block A (Part 3 and 4 Storeys): 5 no. one-bed apartments; 14 no. two-bed apartments; and 3 no. three-bed apartments. These proposed units have private balconies or terraces, and access to a community roof terrace of 112.4 sqm.
- Apartment Block B (Part 3 and 4 Storeys): 5 no. one-bed apartments; 14 no. two-bed apartments; and 3 no. three-bed apartments. These proposed units have private balconies or terraces, and access to a community roof terrace of 112.4 sqm.
- Apartment Block C (Part 3 and 4 Storeys): 4 no. one-bed apartments; 19 no. two-bed apartments and 4 no. three-bed apartments. These proposed units have private balconies or terraces, and access to a community roof terrace of 87 sqm.
- 13 no. apartments above the proposed Neighbourhood Centre comprising; 4 no. own-door two-bed apartments; 3 no. shared-access one-bed apartments; and 6 no. shared-access two-bed apartments. These proposed units have private balconies or terraces, and access to the communal roof terrace of 176 sqm.
- 160 no. own-door apartments in 2- and 3- storey buildings comprising; 16 no. one-bed apartments; 78 no. two-bed apartments, 66 no. three-bed duplex apartments. These units will have private amenity areas in the form of terraces, balconies and/or rear gardens.

The proposed Neighbourhood Centre has a total commercial floor area of 2,141 sqm and accommodates 11 no. commercial units with a variety of uses comprising:

- Convenience shop of 909 sqm (unit 1)
- 3 no. doctor/dentist/physio units of 120 sqm, 120 sqm and 90 sqm (units 6, 7, and 8, respectively)
- café of 125 sqm (unit 4)
- restaurant of 213 sqm (unit 9)
- 5 no. shop/convenience services units of 112 sqm, 49 sqm, 171 sqm, 100sqm and 100 sqm (units 2, 3, 5,10 and 11, respectively). It is envisaged that these units will be occupied by uses such as butchers, green grocers, hairdressers, pharmacies, or a local post office.

Within the Neighbourhood Centre it is proposed to provide a childcare facility (886 sqm) with capacity for in the order of 154 no. children.

A total of 1,008 no. car parking spaces are proposed to serve the proposed development. 650 no. car parking spaces are proposed to serve the 325 no. houses, 312 no. car parking spaces are proposed to serve the 244 no. apartments, and 46 no. car parking spaces are proposed to serve the neighbourhood centre, including the childcare facility.

A total of 732 no. bicycle parking spaces are proposed to serve the development comprising 536 no. long-stay residential spaces, 134 no. residential visitor spaces, and 62 no. bike spaces to serve the neighbourhood centre including the childcare facility.

4. Screening

4.1 Introduction

This section contains the information required for the competent authority to undertake screening for AA for the proposed development.

The aims of this section are to:

- Determine whether the proposed development is directly connected with, or necessary to, the conservation management of any Natura 2000 Sites;
- Provide information on, and assess the potential for the proposed development to significantly effect on Natura 2000 Sites (also known as European sites); and
- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on Natura 2000 sites in view of their conservation objectives.

The proposed development is not directly connected with, or necessary to the conservation management of any Natura 2000 sites.

4.2 Study Area and Scope of Appraisal

Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the Natura 2000 site(s) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

The Zone of Influence (ZoI) comprises the area within which the proposed development may potentially affect the conservation objectives (or qualifying interests) of a Natura 2000 site. There is no recommended zone of influence, and guidance from the National Parks and Wildlife Service (NPWS) recommends that the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects (cumulative).

In ecological and environmental impact assessment, for an effect to occur there must be a risk enabled by having a source (e.g. construction works at a proposed development site), a 'receptor' (e.g. SAC or other ecologically sensitive feature), and a pathway between the source and the receptor (e.g. a watercourse which connects the proposed development site to the SAC, *ex situ* foraging habitat for SCI birds). A 'receptor' is defined as the Special Conservation Interest (SCI) of SPAs or Qualifying Interest (QI) of SACs for which conservation objectives have been set for the European sites being screened.

Consideration is therefore given to the source-pathway-receptor linkage and associated risks between the proposed development and Natura 2000 sites. For a significant effect to occur there needs to be an identified risk whereby a source (e.g. contaminant or pollutant arising from construction activities) affects a particular receptor (i.e. Natura 2000 site) through a

particular pathway (e.g. a watercourse which connects the proposed development with the Natura 2000 site).

The identification of risk does not automatically mean that an effect will occur, nor that it will be significant. The identification of these risks means that there is a possibility of environmental or ecological damage occurring. The level and significance of the effect depends upon the nature of the consequence, likelihood of the risk and characteristics of the receptor.

The precautionary principle is applied for the purposes of screening to ensure that consideration and pre-emptive action is undertaken where there is a lack of scientific evidence. It is noted that mitigation measures are not taken into account in the AA screening assessment process.

Thus, any appreciable direct, indirect or in-combination impacts which could arise from the proposed development in relation to the designated sites within this zone were considered.

4.3 Field Study

Survey surveys were carried out on the 3rd December 2020, 19th May 2021, 9th September 2021 and 8th March 2022 to identify the habitats, flora and fauna present at the site. The surveys assessed the potential for all Qualifying Interests (QIs)/ Special Conservation Interests (SCIs) of European sites and third schedule invasive species to occur within the proposed site.

4.4 Source-Pathway-Receptor Model

The likely effects of the proposed development on any European site has been assessed using a source-pathway-receptor model, where:

- A ‘source’ is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives.
- A ‘pathway’ is defined as the means or route by which a source can affect the ecological receptor.
- A ‘receptor’ is defined as the SCI of SPAs or QI of SACs for which conservation objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potential links to European sites. These are termed as ‘relevant’ European sites/QIs/SCIs throughout this report.

4.5 Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise as being above a de minimis level. The opinion of the Advocate General in CJEU case C-258/11 outlines:

"the requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded.

If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill."

In this report, therefore, 'relevant' European sites are those within the potential ZoI of activities associated with the construction and operation of the proposed development, where LSE pathways to European sites were identified through the source-pathway-receptor model.

4.6 Screening Process

The Screening for Appropriate Assessment will incorporate the following steps:

- Definition of the zone of influence for the proposed works;
- Identification of the European sites that are situated (in their entirety or partially or downstream) within the zone of influence of the proposed works;
- Identification of the most up-to-date QIs and SCIs for each European site within the zone of influence;
- Identification of the environmental conditions that maintain the QIs/SCIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs/SCIs within the European sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which in-combination impacts would likely have significant effects.

4.7 Desktop Review

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this report include reports prepared for the area and information from statutory and non-statutory bodies. The following sources of information and relevant documentation were utilised:

- National Parks & Wildlife Service (NPWS) - www.npws.ie;
- Environmental Protection Agency (EPA) – www.epa.ie;
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie;
- Invasive Species Ireland - http://www.invasivespeciesireland.com/;
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011);
- Kildare County Development Plan 2017-2023 (Kildare County Council 2017) and

- Geohive mapping http://map.geohive.ie.

5. Natura 2000 Sites

5.1 Designated sites within Zone of Influence

Natura 2000 sites within the zone of influence of the proposed development site are listed below in **Table 1** and shown in **Figure 3** and **Figure 4**. The proposed development site does not form part of any Natura 2000 site.

The closest Natura 2000 sites are the Pollardstown Fen SAC (site code 000396) and Moud's Bog Fen SAC (site code 002331) located 2.6km northwest and 3.2km north respectively from the proposed development site. Although these SACs are located within the Liffey catchment, they are located upstream of the proposed development site and in separate sub catchments. There is no hydrological or hydrogeological pathway between these Natura 2000 sites and the proposed development site. The invertebrate qualifying species for the Pollardstown Fen SAC do not occur within the zone of influence of the proposed development site. Therefore, no pathway for impact between Pollardstown Fen SAC and Moud's Bog Fen SAC have been identified.

During construction and operation surface water runoff from the site will be diverted to the River Liffey. Wastewater from the proposed development will also ultimately discharge to the River Liffey via the Upper Liffey Valley Sewerage Scheme (License ref. D0002). There are four Natura 2000 sites within Dublin Bay which are hydrologically connected to the River Liffey. These are South Dublin Bay SAC (site code 000210), South Dublin Bay and River Tolka Estuary SPA (site code 004024), North Dublin Bay SAC (site code 000206) and North Bull Island SPA (site code 004006). These are located approximately 59.2-61.8km downstream of the proposed development site. Although unlikely due to the distance involved, given the hydrological connection, surface water run-off during the construction or operational phase as well as wastewater discharges during operation could potentially impact on the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC and North Bull Island SPA.

The Poulaphouca Reservoir SPA (site code 004063) is located 14.7km southeast of the proposed development site. Qualifying species from this SPA i.e. Greylag Goose and Lesser Black-backed Gull, could potentially forage on or near the proposed development site. Therefore, qualifying species could be impacted by disturbance in *ex situ* habitats during the construction or operation phase.

Therefore, a source-pathway-receptor link has been identified between the source (the proposed SHD development) and the receptor (South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay & River Tolka Estuary SPA and Poulaphuca Reservoir SPA) via a potential pathway (discharge of surface water run-off during construction/operation, wastewater discharges during operation, disturbance during construction and operation and the spread of invasive species). Further information on these Natura 2000 is sites provided below. Site synopses for these Natura 2000 are included in **Appendix 1**.

Given the lack of a hydrological or other connection, no potential impact on any other Natura 2000 site has been identified.

Table 1. Natura 2000 sites and their location relative to the proposed development site

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link	Qualifying interests
Special Area of Conservation (SAC)			
Pollardstown Fen SAC	000396	2.6km west. Northwest.	**Habitats** 7210 Calcareous fens with Cladium mariscus and species of the Caricion davallianae* 7220 Petrifying springs with tufa formation (Cratoneurion)* 7230 Alkaline fens **Species** 1014 Narrow-mouthed Whorl Snail (Vertigo angustior) 1013 Geyer's Whorl Snail (Vertigo geyeri) 1016 Desmoulin's Whorl Snail (Vertigo moulinsiana)
Mouds Bog SAC	002331	3.2km north	**Habitats** 7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion
Ballynafagh Lake SAC	001387	10.5km north	**Habitats** 7230 Alkaline fens **Species** 1065 Marsh Fritillary (*Euphydryas aurinia*) 1016 Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
Ballynafagh Bog SAC	000391	12.4km north	**Habitats** 7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link	Qualifying interests
River Barrow and River Nore SAC	002162	12.9km southwest	**Habitats** 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1170 Reefs 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1410 Mediterranean salt meadows (Juncetalia maritimi) 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 4030 European dry heaths 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels 7220 Petrifying springs with tufa formation (Cratoneurion)* 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* **Species** 1029 Freshwater Pearl Mussel (*Margaritifera margaritifera*) 1016 Desmoulin's Whorl Snail *(Vertigo moulinsiana*) 1355 Otter (*Lutra lutra*) 1092 White-clawed Crayfish (*Austropotamobius pallipes*) 1106 Salmon (*Salmo salar*)

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link	Qualifying interests
			1421 Killarney Fern (*Trichomanes speciosum*) 1103 Twaite Shad (*Alosa fallax fallax*) 1990 Nore Pearl Mussel (*Margaritifera durrovensis*) 1095 Sea Lamprey (*Petromyzon marinus*) 1096 Brook Lamprey (*Lampetra planeri*) 1099 River Lamprey (*Lampetra fluviatilis*)
South Dublin Bay SAC	000210	43.6km northeast (59.2km downstream)	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes
North Dublin Bay SAC	000206	45.4km northeast (61.8km downstream)	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1410 Mediterranean salt meadows (Juncetalia maritimi) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with Ammophila arenaria (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks **Species** 1395 Petalwort (*Petalophyllum ralfsii*)

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link	Qualifying interests
Special Protection Area (SPA)			
Poulaphuca Reservoir SPA	004063	14.7km southeast.	**Birds** A043 Greylag Goose (*Anser anser*) A183 Lesser Black-backed Gull (*Larus fuscus*)
South Dublin Bay and River Tolka Estuary SPA	004024	41.8km northeast (59.2km downstream)	Birds A144 Sanderling (*Calidris alba*) A157 Bar-tailed Godwit (*Limosa lapponica*) A149 Dunlin (*Calidris alpina*) A162 Redshank (Tringa totanus) A179 Black-headed Gull (Chroicocephalus ridibundus) A143 Knot (*Calidris canutus*) A192 Roseate Tern (*Sterna dougallii*) A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A141 Grey Plover (*Pluvialis squatarola*) A130 Oystercatcher (*Haematopus ostralegus)* A194 Arctic Tern (*Sterna paradisaea*) A193 Common Tern (*Sterna hirundo*) A137 Ringed Plover (*Charadrius hiaticula*) **Habitats** Wetlands
North Bull Island SPA	004006	43.0km northeast (61.8km downstream)	**Birds** A160 Curlew (*Numenius arquata*) A149 Dunlin (*Calidris alpina*) A157 Bar-tailed Godwit (*Limosa lapponica*) A162 Redshank (*Tringa totanus)*

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link	Qualifying interests
			A179 Black-headed Gull (*Chroicocephalus ridibundus)* A144 Sanderling (*Calidris alba*) A156 Black-tailed Godwit (*Limosa limosa*) A143 Knot (*Calidris canutus*) A169 Turnstone (*Arenaria interpres*) A054 Pintail (*Anas acuta)* A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A048 Shelduck (*Tadorna tadorna*) A052 Teal (*Anas crecca*) A141 Grey Plover (*Pluvialis squatarola*) A056 Shoveler (*Anas clypeata*) A130 Oystercatcher (*Haematopus ostralegus*) A140 Golden Plover (*Pluvialis apricaria*) **Habitats** Wetlands

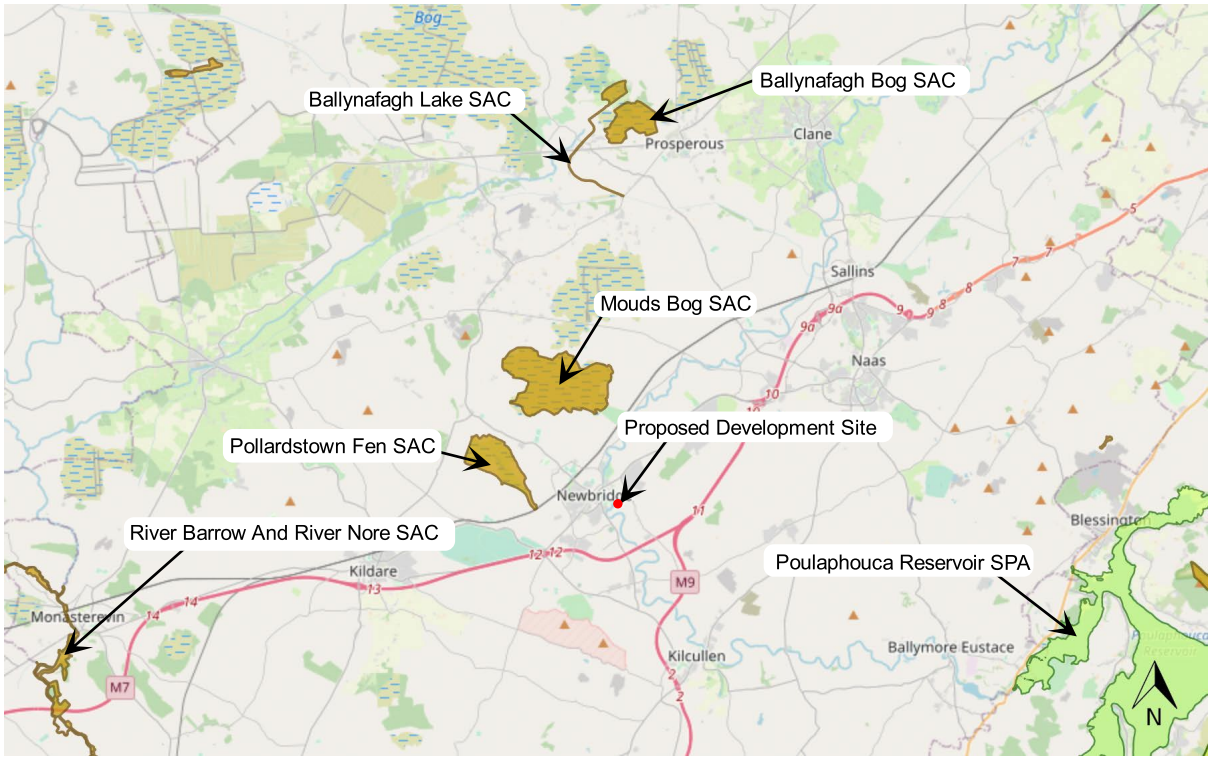


Figure 3. Location of the proposed development site and Natura 2000 sites within Zone of Influence (Zol) (Map 1) | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

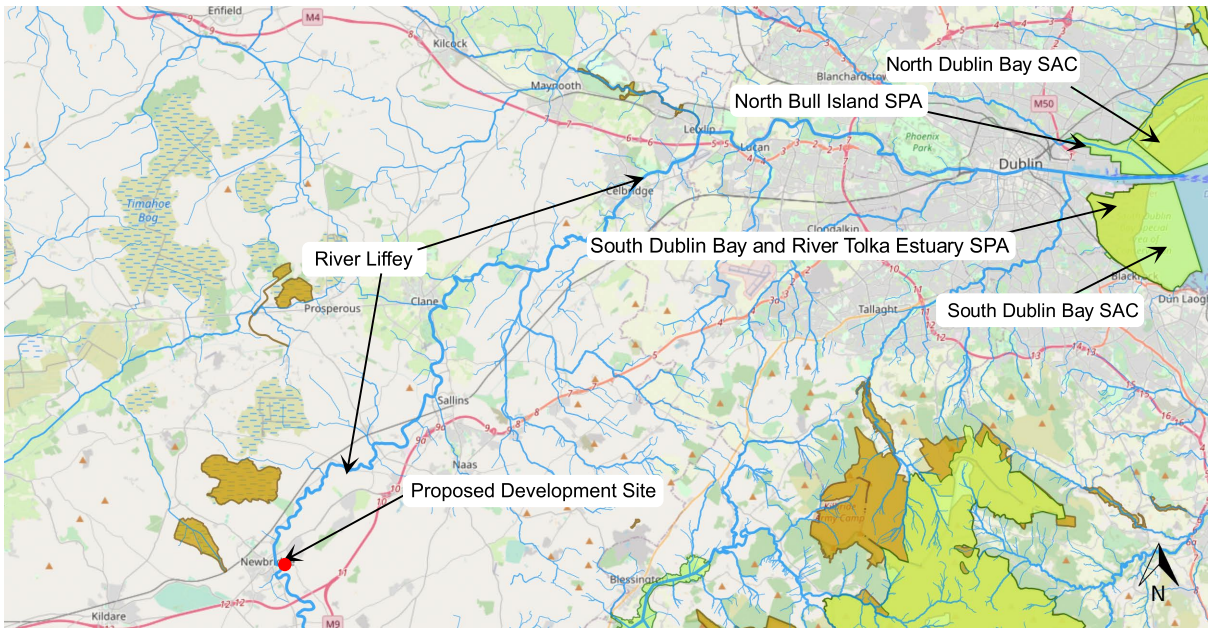


Figure 4. Location of the proposed development site and Natura 2000 sites within Zone of Influence (Zol) (Map 2) | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

5.2 European Sites Descriptions

5.2.1 North Bull Island SAC

The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost five kilometres long and one kilometre wide and runs parallel to the coast between Clontarf and Sutton. The sediment which forms the island is predominantly glacial in origin and siliceous in nature. Between the island and the mainland there occurs two sheltered intertidal areas which are separated by a solid causeway constructed in 1964. The seaward side of the island has a fine sandy beach. A substantial area of shallow marine water is included in the site. The interior of the island is excluded from the site as it has been converted to golf courses. The proximity of the North Bull Island to Dublin City results in it being a very popular recreational area. It is also very important for educational and research purposes. Nature conservation is a main land use within the site.

Site possesses an excellent diversity of coastal habitats. The North Bull Island dune system is one of the most important systems on the east coast and is one of the few in Ireland that is actively accreting. It possesses extensive and mostly good quality examples of embryonic, shifting marram and fixed dunes, as well as excellent examples of humid dune slacks. Both Atlantic and Mediterranean salt marshes are well represented and a particularly good marsh zonation is shown. The salt marshes grade into mudflats and sandflats, some of which are dominated by annual Salicornia species. *Petalophyllum ralfsii* occurs at its only known station away from the western seaboard. The site has five Red Data Book vascular plant species and four Red Data Book bryophyte species. This is one of the most important sites for wintering waterfowl in Ireland, with internationally important populations of *Branta bernicla horta*, *Calidris canutus* and *Limosa lapponica*, plus nationally important numbers of a further 14 species. 20% of the national total of *Pluvialis squatarola* occurs here. Formerly it had important colony of *Sterna albifrons*. North Dublin Bay is nationally important for three insect species. The scientific interests of the site have been well documented and future prospects are good owing to the various designations assigned to site.

5.2.2 South Dublin Bay SAC

This intertidal site extends from the South Wall at Dublin Port to the West Pier at Dun Laoghaire, a distance of approximately 5 km. At their widest, the intertidal flats extend for almost 3 km. The seaward boundary is marked by the low tide mark, while the landward boundary is now almost entirely artificially embanked. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. A number of small streams and drains flow into the site. The proximity of the site to Dublin City results in it being a very popular recreational area. It is also important for educational and research purposes.

Site possesses a fine and fairly extensive example of intertidal flats. Sediment type is predominantly sand, with muddy sands in the more sheltered areas. A typical macro-invertebrate fauna exists. Has the largest stand of Zostera on the east coast. Supports part of the important wintering waterfowl populations of Dublin Bay. Regularly has an internationally population of *Branta bernicila horta*, plus nationally important numbers of at least a further 6 species, including *Limosa lapponica*. Regular autumn roosting ground for significant numbers

of *Sterna* terns, including *S. dougallii*. The scientific interests of the site have been well documented.

5.2.3 North Bull Island SPA

The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5km long and 1km wide and runs parallel to the coast between Clontarf and Sutton. The sediment which forms the island is predominantly glacial in origin and siliceous in nature. A well-developed dune system runs the length of the island, with good examples of embryonic, shifting marram and fixed dunes, as well as excellent examples of humid dune slacks. Extensive salt marshes also occur. Between the island and the mainland occur two sheltered intertidal areas which are separated by a solid causeway constructed in 1964. The seaward side of the island has a fine sandy beach. A substantial area of shallow marine water is included in the site. Part of the interior of the island has been converted to golf courses. The proximity of the North Bull Island to Dublin City results in it being a very popular recreational area. It is also very important for educational and research purposes. Nature conservation is a main land use within the site.

The site is among the top ten sites for wintering waterfowl in the country. It supports internationally important populations of *Branta bernicila hrota* and *Limosa lapponica* and is the top site in the country for both of these species. A further 14 species have populations of national importance, with particular notable numbers of *Tadorna tadorna* (8.5% of national total), *Anas acuta* (11.6% of national total), *Pluvialis squatarola* (6.9% of national total), *Calidris canutus* (10.5% of national total). North Bull Island SPA is a regular site for passage waders such as *Philomachus pugnax, Calidris ferruginea* and *Tringa erythropus*. The site supports *Asio flammeus* in winter. Formerly the site had an important colony of *Sterna albifrons* but breeding has not occurred in recent years. The site provides both feeding and roosting areas for the waterfowl species. Habitat quality for most of the estuarine habitats is very good. The site has a population of the rare *Petalophyllum ralfsii* which is the only known station away from the western seaboard as well as five Red Data Book vascular plant species and four bryophyte species. It is nationally important for three insect species. Wintering bird populations have been monitored more or less continuously since the late 1960s, and the other scientific interests of the site have also been well documented. Future prospects are good owing to various designations assigned to site.

5.2.4 South Dublin Bay and River Tolka Estuary SPA

This site comprises a substantial part of Dublin Bay. It includes virtually all of the intertidal area in the south bay, as well as much of the Tolka Estuary to the north of the River Liffey. A portion of the shallow bay waters is also included. In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. The sands support the largest stand of *Zostera noltii* on the East Coast. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. Sediments in the Tolka Estuary vary from soft thixotrophic muds with a high organic content in the inner estuary to exposed, well aerated sands off the Bull Wall. The proximity of the site to Dublin City results in it being a very popular recreational area. It is also important for educational and research purposes.

The site possesses extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of *Branta bernicla hrota*, which feeds on *Zostera noltii* in the autumn. It has nationally important numbers of a further 6 species: *Haematopus ostralegus, Charadrius hiaticula, Calidris canutus, Calidris alba, Calidris alpina* and *Limosa lapponica*. It is an important site for wintering gulls, especially *Larus ridibundus* and *Larus canus*. South Dublin Bay is the premier site in Ireland for *Larus melanocephalus*, with up to 20 birds present at times. Is a regular autumn roosting ground for significant numbers of terns, including *Sterna dougallii, S. hirundo* and S*. paradisaea*.

5.2.5 Poulaphuca Reservoir SPA

Poulaphouca Reservoir SPA, located in the western foothills of the Wicklow Mountains, was created in 1944 by damming of the River Liffey for the purpose of generating electricity from hydropower. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mid- east and south-east regions. The reservoir receives water from two main sources, the River Liffey at the northern end, and the Kings River at the southern end. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greylag Goose and Lesser Black-backed Gull.

Poulaphouca Reservoir is of national importance for its Greylag Goose population, which is one of the largest in the country. The site provides the main roost for the birds, with feeding occurring mostly on improved grassland outside of the site. A mean peak of 701 individuals occurred during the five seasons 1995/96 to 1999/2000. The reservoir attracts roosting gulls during winter, most notably a large population of Lesser Black-backed Gull (651), which in Ireland is rare in winter away from the south coast.

The principal interest of the site is the Greylag Goose population, which is of national importance. A range of other wildfowl species also occurs, including Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull. Part of Poulaphouca Reservoir SPA is a Wildfowl Sanctuary.

5.3 Natura 2000 sites – Features of interests and conservation objectives

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as ‘qualifying interests’ and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A ‘qualifying interest’ is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The conservation objectives for the site are detailed in:

- NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

- NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2021) *Conservation objectives for Poulaphouca Reservoir SPA [004063]. Generic Version 8.0. Department of Housing, Local Government and Heritage*.

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that 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 favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or 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 species and/or habitats listed as features of interests for South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay & River Tolka Estuary SPA and Poulaphuca Reservoir SPA are included in **Tables 2 to 6**.

Table 2. Features of Interest for North Dublin Bay SAC

Habitat/species Code	Habitat /Species	Conservation objective
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1210	Annual vegetation of drift lines	Restore
1310	Salicornia and other annuals colonising mud and sand	Restore
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Maintain
1410	Mediterranean salt meadows (*Juncetalia maritimi*)	Maintain
2110	Embryonic shifting dunes	Restore

Habitat/species Code	Habitat /Species	Conservation objective
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	Restore
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	Restore
2190	Humid dune slacks	Restore
1395	Petalwort *Petalophyllum ralfsii*	Maintain

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

Table 3. Features of Interest for South Dublin Bay SAC

Habitat/species Code	Habitat /Species	Conservation objective
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1210	Annual vegetation of drift lines	Maintain/Restore
1310	Salicornia and other annuals colonising mud and sand	Maintain/Restore
2110	Embryonic shifting dunes	Maintain/Restore

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

Table 4: Features of Interest for North Bull Island SPA

Species Code	Species	Scientific name	Conservation objective
A046	Brent Goose	*Branta bernicla hrota*	Maintain
A048	Shelduck	*Tadorna tadorna*	Maintain
A052	Teal	*Anas crecca*	Maintain
A054	Pintail	*Anas acuta*	Maintain
A056	Shoveler	*Anas clypeata*	Maintain
A130	Oystercatcher	*Haematopus ostralegus*	Maintain
A140	Golden Plover	*Pluvialis apricaria*	Maintain
A141	Grey Plover	*Pluvialis squatarola*	Maintain
A143	Knot	*Calidris canutus*	Maintain
A144	Sanderling	*Calidris alba*	Maintain
A149	Dunlin	*Calidris alpina alpina*	Maintain
A156	Black-tailed Godwit	*Limosa limosa*	Maintain
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A160	Curlew	*Numenius arquata*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A169	Turnstone	*Arenaria interpres*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A999	Wetlands & waterbirds		Maintain

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

Table 5: Features of Interest for South Dublin Bay & River Tolka Estuary SPA

Species Code	Species	Scientific name	Conservation objective
A046	Brent Goose	*Branta bernicla hrota*	Maintain
A130	Oystercatcher	*Haematopus ostralegus*	Maintain
A137	Ringed Plover	*Charadrius hiaticula*	Maintain
A141	Grey Plover	*Pluvialis squatarola*	Maintain
A143	Knot	*Calidris canutus*	Maintain
A144	Sanderling	*Calidris alba*	Maintain
A149	Dunlin	*Calidris alpina alpina*	Maintain
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A192	Roseate Tern	*Sterna dougallii*	Maintain
A193	Common Tern	*Sterna hirundo*	Maintain
A194	Arctic Tern	*Sterna paradisaea*	Maintain
A999	Wetlands & waterbirds		Maintain

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

Table 6. Qualifying Species for Poulaphuca Reservoir SPA

Species code	Species		*Conservation objective*
A043	Greylag Goose	*Anser anser*	Maintain/Restore
A183	Lesser Black-backed Gull	*Larus fuscus*	Maintain/Restore

Restore = Restore favourable conservation condition, Maintain = Maintain favourable conservation condition

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, “Wetland and Waterbirds” may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a further objective is to maintain or restore the favourable conservation condition of the wetland habitat within the North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise them.

It should be noted that some of the Natura 2000 sites overlap with each other and thus the conservation objectives for these sites should be used in conjunction with those for overlapping and adjacent sites as appropriate.

6. Water Quality data

6.1 River Basin Management Plan for Ireland 2015 – 2018 (2nd /3rd Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The

challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

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

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 7** and the location of these shown in **Figure 5.**

Table 7. WFD Status

Catchment: Liffey and Dublin Bay (Code 9) – 2nd Cycle
This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km2. The largest urban centre in the catchment is Dublin City. The other main urban centres are Dun Laoghaire, Lucan, Clonee, Dunboyne, Leixlip, Maynooth, Kilcock, Celbridge, Newcastle, Rathcoole, Clane, Kill, Sallins, Johnstown, Naas, Newbridge, Athgarvan, Kilcullen and Blessington. The total population of the catchment is approximately 1,255,000. The Liffey catchment contains the largest population of any catchment in Ireland and is characterised by a sparsely populated, upland south eastern area and a densely populated, flat, low lying area over the remainder of the catchment basin. The Liffey catchment comprises 17 sub-catchments with 77 river water bodies, six lakes, six transitional and five coastal water bodies, and 16 groundwater bodies The proposed development site is in the Liffey_080 River Water Body. Status Reports have been prepared this Water Body. Status means the condition of the water in a watercourse and is defined by its ecological and chemical conditions, whichever is worse. Water Bodies are ranked in one of five classes,' High', 'Good', 'Moderate', 'Poor' and 'Bad'. The WFD requires measures to ensure waters achieve at least 'Good Status' by 2015 and that their current status does not deteriorate. Where necessary, for example in heavily impacted or modified watercourses, extended deadlines (2021 and 2027) have been set for achieving the following objectives: • Prevent Deterioration • Restore Good Status

- Reduce Chemical Pollution
- Achieve Protected Areas Objectives

The objectives for particular watercourses are based on 'Pressure and Impact Assessments' of human activity, including point and diffuse emissions, land use and morphological conditions on surface waters to identify those water bodies that are 'At Risk' of failing to meet the WFD objectives. The ecological status/potential of the LIFFEY_080 is classified as 'Good' and the river is 'Not at Risk' of meeting its RBMP objectives. The WWTP discharge point is located in the Liffey_SC_060 sub-catchment. This small sub-catchment only contains three waterbodies. Liffey_100 requires further investigative assessment to identify the source of the pressure believed to be the WWTP. Although Liffey_110 is unassigned Kildare CoCo indicated pressure from a pumping station that needs to be considered. In Liffey_120 there is elevated P and NH3. There are known issues with a historic landfill in the waterbody and also urban diffuse pressures from Naas. The status of waterbodies in the vicinity of Dublin Bay are also described below.

Waterbodies relevant to the proposed project (2nd Cycle)

Waterbody	WFD Status	Risk	**Pressure Category** **WFD Status**
Liffey_080	Good	Not at risk	n/a
Liffey_100	Moderate	Review	Urban wastewater
Liffey_120	Good	Not at risk	n/a
Liffey Estuary	Good	At risk	Urban wastewater
Dublin Bay	Good	Not at risk	n/a

Source: EPA envision mapping and www.catchments.ie 22/04/2021

6.2 Urban Wastewater Treatment Directive

The Waste Water Discharge (Authorisation) Regulations 2007 (S.I. 684 of 2007) gives effect to the requirements of the Urban Waste Water Treatment Directive (Directive 91/271/EEC) and the Water Framework Directive (2000/60/EC) in Ireland. The Urban Waste Water Treatment Directive (UWWTD) lays down the requirements for the collection, treatment and discharge of urban waste-water and specifies the quality standards which must be met — based on agglomeration size — before treated waste-water is released into the environment.

The priority objective for this river basin planning cycle is to secure compliance with the Urban Waste Water Treatment Directive and to contribute to the improvement and protection of waters in keeping with the water-quality objectives established by this Plan. Achieving this objective entails addressing waste-water discharges and overflows where protected areas (i.e. designated bathing waters and shellfish waters) or high-status waters are at risk from urban waste-water pressures.

As part of the proposed development wastewater discharging from the proposed development will be conveyed to the Upper Liffey Valley Sewerage Scheme WWTP (D0002) for treatment prior to discharging into the River Liffey.

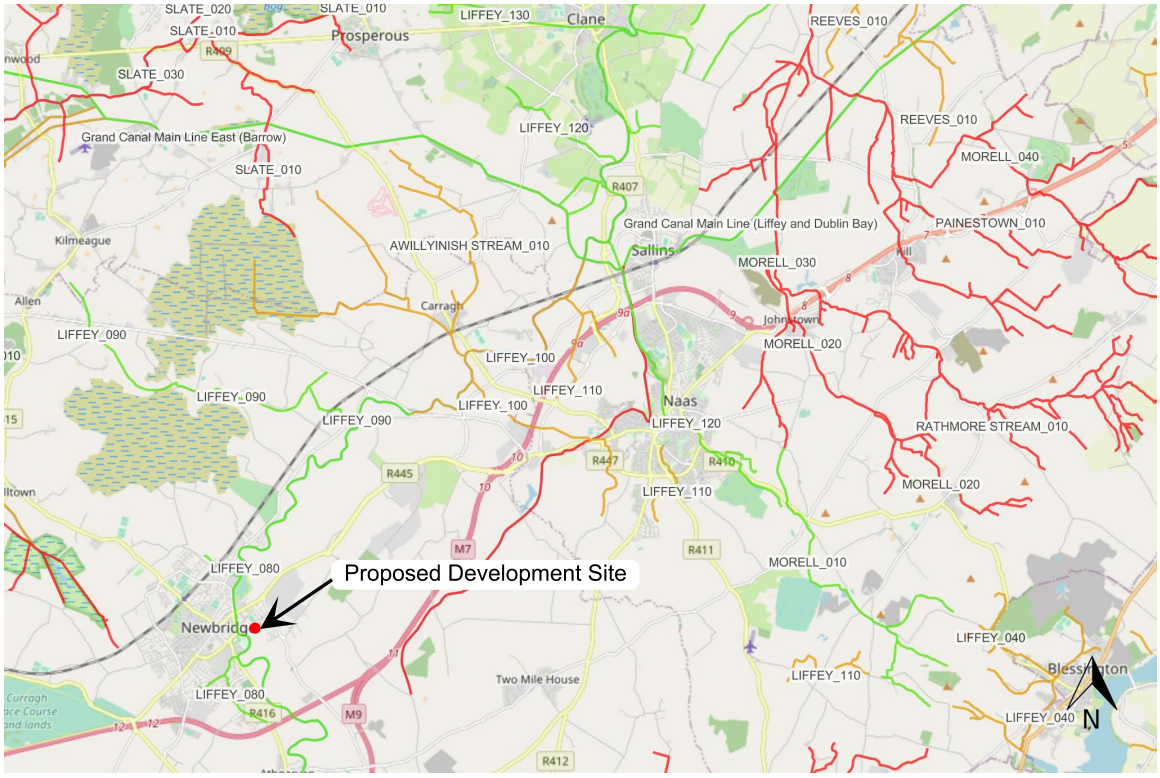


Figure 5. WFD status waterbodies in the vicinity of the proposed development | Source: EPA Envision mapping | not to scale.

7. Site Surveys

7.1 Habitat survey

Survey surveys were carried out on the 3rd December 2020, 19th May 2021, 9th September 2021 and 8th March 2022 to identify the habitats, flora and fauna present at the site. Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site was classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I Habitats where required. The survey results are representative of the habitats within the application site and include the dominant and characteristic species of flora.

An overview of habitats recorded within the site is shown in **Figure 6.** The habitats recorded onsite as well as their ecological value is detailed in **Table 8**. Site photographs are also included below. No rare plant species were recorded within the works area during the site survey and given the modified nature of the habitats within the proposed development area are highly unlikely to occur.

Table 8. Habitats recorded within proposed development site boundary

Habitat	Comments
Arable Crops BC1	The primary land use is for arable crops. The most common crop is Spring Barley *Hordeum vulgare*, which has been sown as a monocrop over much of the site area. Fields cultivated for arable crops are characterised by a limited diversity of grasses and herbaceous species. Species noted including Common Poppy *Papaver rhoes* and Common Field-Speedwell *Veronica persica* which are common weed species of this type of agricultural land. This habitat does not have links to Annex I habitat.
Dry meadow and grassy verges GS2	This habitat has developed on a bank between an existing hedgerow and drain. This habitat is dominated by common species including Cocksfoot *Dactylis glomerata*, Common Vetch *Vicia sativa* and Bramble *Rubus fruiticosus*. In absence of active management scrub species are likely to become more dominant (small area not mapped). Dry meadow and grassy verge loosely corresponds to the annexed habitat, 'lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) (6510)'. The dry meadow and grassy verge habitat within the study area is not a valuable example of this habitat type.
Dry meadow and grassy verges GS2/Tall Herb Swamp FS2	The section of the site south of the river is a mosaic of formerly grazed grassland and tall herb swamp vegetation along the riverbank. Currently this habitat is not actively managed or grazed with a preponderance of coarse grasses including False Oat Grass *Arrhenatherum elatius* and Cock's Foot *Dactylus glomerata* are common. Links with Annex I: *Corresponds to the annexed habitat, 'lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) (6510)'.* Areas of this habitat closer to the riverbank have some characteristics of tall herb swamp. These areas are occasionally waterlogged. They are dominated by Fool's Watercress *Apium nodiflorum* and Hemlock Water Droplet *Oenanthe crocata.* Patches of Soft Rush *Juncus effusus* and Common Reed *Phragmites australis* are present but not dominant. Occasional trees, particularly Willow *Salix sp.,* are present with a small copse of Hawthorn *Crataegus monogynus* was also noted. Links with Annex I: Tall-herb swamps can include pockets of the annexed habitat 'hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)'. In Ireland, however, stands of the latter are usually fragmented and poorly developed. This is not a valuable example of this habitat type.
Hedgerows WL1/ Treelines WL2/	The site is generally bordered by hedgerows and treelines. These linear vegetated boundaries are not homogenous. Those along the southern and western boundaries of the site are classified as treelines, with taller trees (5m+). The dominant mature trees include Beech *Fagus sylvatica*, Sycamore *Acer pseudoplatanus* and Scots Pine *Pinus sylvestris*. Poplar *Populus sp.* also occurs. Understorey species include Bramble *Rubus fruticosus*, Elder *Sambucus nigra*, Cleavers *Galium aparine* and Common Vetch. Along the northern and eastern borders, linear vegetation is thinner and generally under 5m in height and these linear features are classified as hedgerows. The occasional, trees recorded include those mentioned above as well as Hawthorn and Sessile Oak *Quercus petraea*. Scrub vegetation is common and dominates in parts. Species noted include Rosebay Willowherb *Chamaenerion angustifolium*,

Habitat	Comments
	Cow Parsley *Anthriscus sylvestris*, Guelder-Rose *Viburnum opulus*, Hedge Mustard *Sisymbrium officinale*, Groundsel *Senecio vulgaris*, Silverweed *Argentina anserine* and Dandelion *Taraxicum* spp. This habitat does not correspond to an Annex I habitat.
Mixed Broadleaved Woodland WD1	Some areas of wider woodland border the river in the southern section of the site. Some conifers are present, however broadleaved species predominate. The tallest and most mature specimens are Beech and Sessile Oak. Some Scots Pine and Sycamore are also present. The understory includes Sycamore, Hawthorn, Bracken *Pteridium aquilinum* and Common Vetch. There is a strong component of willow including Crack Willow *Salix fragilis* and Goat Willow *Salix caprea*. It therefore has elements of Riparian woodland but is unlikely to have significant levels of flooding. This habitat does not correspond to an Annex I habitat.
Drainage Ditch FW4	A drainage ditch runs through the site and along part of the northern site boundary. The channel is approximately 2m wide and flows are limited with isolated pools during low flow conditions. Instream vegetation includes Water Crowfoot *Ranunculus aquatalis* and Blanket Weed *Chlamydomonas* spp. Drier sections of the ditch support Soft Rush *Juncus effusus* and Meadow Grass *Poa annua.* Minnow *Phoxinus phoxinus* were noted in small pools, although this species is unlikely to persist during drier periods when the drain is essentially stagnant or dry. As this species is common in the River Liffey it can readily recolonise the drain when flows increase. Therefore, this habitat is not considered a critical resource for this species. The banks are overgrown with Bramble, Rosebay Willowherb, and Soft Rush. Small areas of riparian Given the limited size of the drain, limited prey availability and frequent dog usage this habitat is unlikely to be of significant value for Otter. No signs of Otter were recorded during site surveys. This habitat does not correspond to an Annex I habitat.
Depositing/Lowland Rivers FW2	A meander of the River Liffey borders the south-western corner of the site. At this location the river is approximately 23m wide and fast-flowing with low, sloping banks. Filamentous algae along the stretch of the river covers a signficiant proportion of the riverbed, greatly reducing the overall value of the sites in terms of spawning and, to a lesser extent, nursery habitat. Bankside vegetation along the site boundary is dense with Bramble forming thickets. Bankside vegetation includes Elder, Beech, Sycamore, Hawthorn and the understory includes Bramble, Bracken, Nettle *Urtica dioica* and Hogweed *Heracleum sphondylium*. Hemlock Water-Dropwort *Oenanthe crocata* is very common at the waters edge. In-stream vegetation includes Water Crowfoot *Ranunculus peltatus*. The River Liffey supports Otter and it is considered probable that otter utlise the river and riparian habitat where the site borders the river. There is dense vegetation between the site and the river with dense bramble and mature trees which limits access. No evidence of Otter including spraints, slides, couches, feeding signs or holts were recorded. However taking a worst case scenario

Habitat	Comments
	approach it is assumted that the Liffey where it adjoins the site is used by otter for foraging. FW2 has links to the Annex I habitat Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (3260). The River Liffey has not been designated as a Natura 2000 site but is considered a high value habitat at a regional level.
Buildings and Artificial Surfaces BL3	This habitat includes a number of buildings in the easter section of the site. These include the main central barn-shaped warehouse structure, a smaller warehouse structure, a one-storey dwelling, and a two-storey dwelling. Also included within the category are the existing roundabout, paths and yards surrounding these buildings. The warehouse buildings have concrete lower sections, with upper sections and roofs of Kingspan cladding. The residential houses are stone/concrete with tiled roofs and are currently in use. All structures are relatively modern and none have openings accessible to or suitable for bats. The only openings present are ventilator shafts on the large warehouse, but these are modern and well-maintained. This habitat does not have links to Annex I habitat
Riparian Woodland WN5	The section of the drainage ditch which runs parallel to the northern boundary has narrow strips of riparian woodland where periodic flooding occurs. Willows *Salix* spp are dominant with Alder *Alnus glutinosa and Gorse* also present. Wetland species such as Common Reed *Phragmites australis* and Reed Canary Grass *Phalaris arundinacea* are present but do not dominate. Other species noted include Nettle, Hemlock Water-Dropwort and Creeping Buttercup. WN5 has Links with *Annex I. Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-padion, Alnion incanae, Salicion albae) (91E0).* This is a small isolated area of habitat which is not of significant ecological value.

Figure 6. Habitat map

Pic 1: Field of arable crops BC1 surrounding the main buildings. Looking west.

Pic 2. Area of Hedgerow WL1 with Treeline WL2 beyond. Souther edge of site.

Pic 3. Mixed Broadleaved Woodland WD1 at the south of the site.

Pic 4. Stagnant area of the central Drainage Ditch FW4.

Pic 5. River FW2 at accessible point, looking across at western bank.

Pic 6. Main large central warehouse structure BL3. Eastern edge of structure.

Pic 7. Smaller warehouse structure, southern edge.

Pic 8. Residential house at northeast of site, southern edge.

7.2 Birds

Bird species listed in Annex I of the Birds Directive are considered a conservation priority. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation concern. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable (Gilbert *et al*. 2021).

Bird surveys were carried out in conjunction with habitat surveys on the 3rd December 2020, 19th May 2021, 9th September 2021 and 8th March 2022. During the survey, all birds seen or heard within the development site were recorded. Bird species listed in Annex I of the Birds Directive are considered a conservation priority. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. Species recorded within the site are shown in **Table 9**.

Table 9. Bird species recorded within proposed development site

Species		Birds Directive Annex	BOCCI	
		I	Red List	Amber List
Blackbird	*Tardus Turdus merula*			
Blue Tit	*Cyanistes caeruleus*			
Bullfinch	*Pyrrhula pyrrhula*			
Buzzard	*Buteo buteo*			
Chaffinch	*Fringilla coelebs*			
Chiffchaff	*Phylloscopus collybita*			
Collared Dove	*Streptopelia decaocta*			
European Swallow	*Hirundo rustica*			x
Great Tit	*Parus major*			

Species		Birds Directive Annex	BOCCI	
		I	Red List	Amber List
Hooded Crow	*Corvus cornix*			
House Sparrow	*Passer domesticus*			
Jackdaw	*Corvus monedula*			
Mistle Thrush	*Turdus piscivorus*			
Pheasant	*Phasianus colchicus*			
Robin	*Erithacus rubecula.*			
Rook	*Corvus frugiligus*			
Song Thrush	*Turdus philomelos*			
Willow Warbler	*Phylloscopus trochilus*			x
Wood Pigeon	*Columba palumbus*			
Yellowhammer	*Emberiza citrinella*		x	

Overall, the proposed development site is of local value for terrestrial bird species that are relatively common in the Irish countryside. Good quality treelines, woodland and hedgerows at the site provide a range of nesting habitat for common bird species.

No Annex I species were recorded at the site. The River Liffey which runs through the southwestern corner of the site could potentially provide foraging habitat for Kingfisher *Alcedo atthis*. However, no signs of Kingfisher were recorded during site surveys and due to the low sloping river banks at the site there is no suitable nesting habitat within the site or in proximity to the site boundary. No signs of wintering waders or waterfowl were recorded during site surveys. However, Whooper Swans are known to forage on agricultural grassland and cereal stubble in autumn and winter (Robinson et al, 2004). While Whooper Swan could potentially forage at the site during the winter months, given the large areas of arable farming in the region the area within the proposed development site does not provide critical habitat for this species.

One Red List species Yellowhammer *Emberiza citronella* (one singing male) was recorded within the treeline/hedgerow on the southern end of the site. Historically, this species was widespread throughout the country but has suffered declines due to the decrease in cereal crop cultivation in Ireland. Due to this decline, the majority of the Yellowhammer population is confined to the east and south of Ireland. An adult Yellowhammer will mainly feed on the grains produced by grasses and cereals with the young being fed various insect species. In Ireland, the Yellowhammer is strongly associated with cereal cultivation and by extension, is most commonly found in farmland, in close proximity to such crops.

Two Amber List species Swallow *Hirundo rustica* and Willow Warbler *Phylloscopus trochilus* were recorded. Swallow were recorded foraging at the site but no nest sites were recorded. Nesting Willow Warbler were recorded within the woodland habitat on the southern end of the site.

The Red List species Yellowhammer and Amber List species Willow Warbler were recorded within the site boundary but overall the site supports a mixture of terrestrial bird species that are relatively common in the Irish countryside. No Annex I species, were recorded within the proposed development site. Although species more speicalised species such as Grey Heron and Dipper may utilise riverine habitats, no signs of Kingfisher were noted.

7.3 Invasive Species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality. The NBDC lists a number of both aquatic and terrestrial high impact invasive plant species which have been recorded within hectad N81 (**Table 10**). It should be noted that this data relates to the entire 10km^2 area and these species will not necessarily occur within the proposed development site boundary.

Table 10. NBDC records of high impact invasive species from N81

Species Group	Species name
Flatworm (Turbellaria)	Arthurdendyus triangulatus
Flowering plant	Cherry Laurel (*Prunus laurocerasus*)
Flowering plant	Indian Balsam (*Impatiens glandulifera*)
Flowering plant	Japanese Knotweed (*Fallopia japonica*)
Insect - beetle (Coleoptera)	Harlequin Ladybird (*Harmonia axyridis*)
Terrestrial mammal	American Mink (*Mustela vison*)
Terrestrial mammal	Brown Rat (*Rattus norvegicus*)
Terrestrial mammal	Eastern Grey Squirrel (*Sciurus carolinensis*)
Terrestrial mammal	Fallow Deer (*Dama dama*)
Terrestrial mammal	House Mouse (*Mus musculus*)
Terrestrial mammal	Sika Deer (*Cervus nippon*)

Source: NBDC 11/02/22

The control of invasive species in Ireland comes under the Wildlife (Amendment) Act 2000, where it states that

'*Any person who— [...] plants or otherwise causes to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores of flora, ['refers only to exotic species thereof']][...] otherwise than under and in accordance with a licence granted in that behalf by the Minister shall be guilty of an offence.'*

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed (*Fallopia japonica*), as follows: "any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence."

The third schedule invasive species Himalayan Balsam *Impatiens glandulifera* was recorded along the banks of the River Liffey the proposed development site (**Figure 7**). Himalayan Balsam is a member of the busy Lizzie family (Balsaminacea) and as its name suggests, is native to the Himalaya region of Asia. It was introduced as a garden plant in the mid-1800's (Royal Horticultural Society 2008a) and quite swiftly became established along waterways and in other damp places by means of its prolific seed production. It is an annual plant forming dense upright stands approximately 1m tall where it effectively out- competes surrounding herbs and grasses. It is tolerant of shade and does very well in the canopy of riparian woodland. In the autumn it dies back leaving the ground bare and vulnerable to erosion.

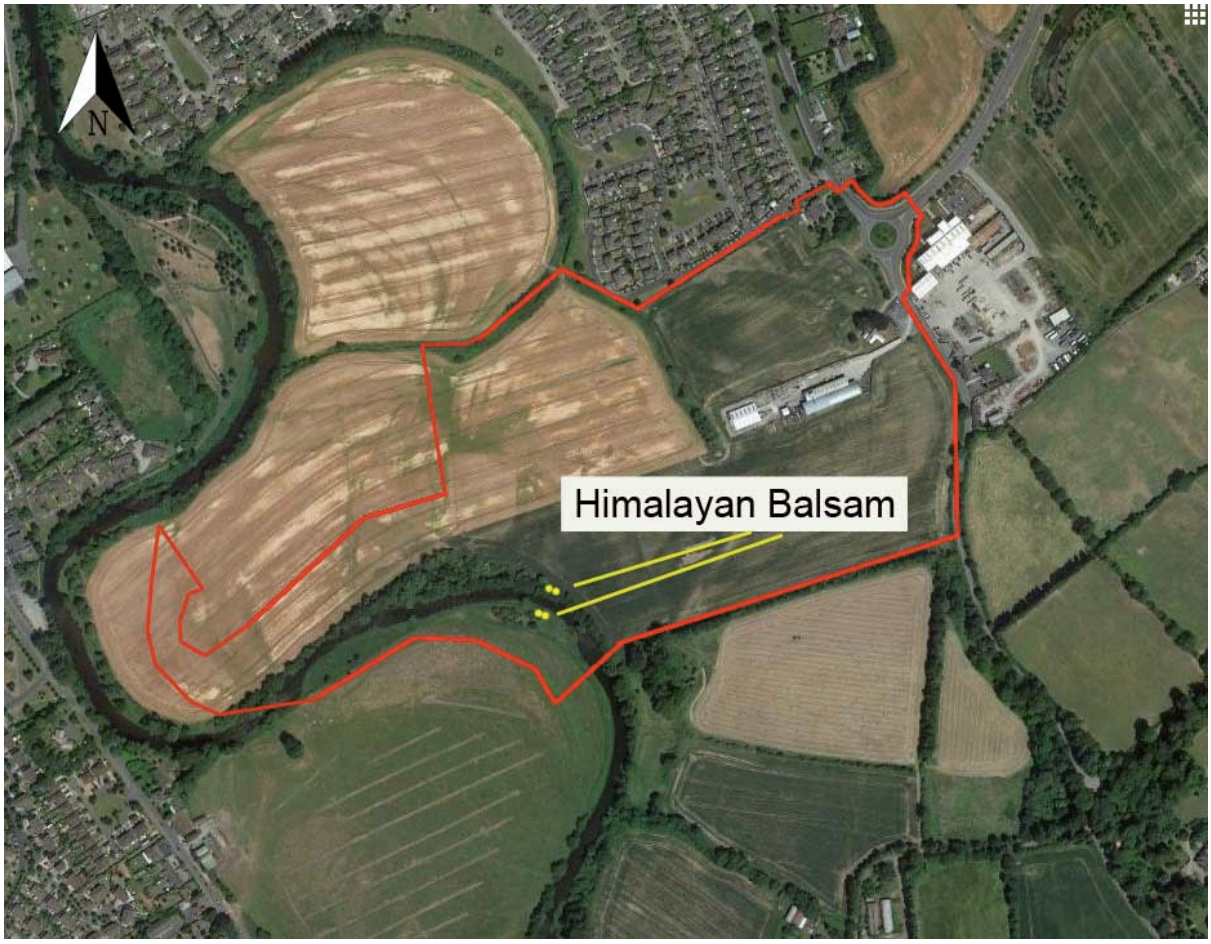


Figure 7. Himalayn Balsam location within proposed development site

8. Potential Impacts

All potential impacts would relate to direct and indirect impacts to relevant habitats and fauna of the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA, South Dublin Bay & River Tolka Estuary SPA and Poulaphuca Reservoir SPA. Impacts are based on the EC (2018), professional judgement and criteria or standards where available.

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on Natura 2000 sites. As part of the assessment direct, indirect and in-combination impacts were considered. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan - in combination with other plans and projects have been established.

As part of the assessment the potential for impacts associated with the development were reviewed as outlined below:

- Potential impacts of loss of habitat
- Potential impacts from noise and disturbance
- Potential impacts of surface water run-off

- Potential impacts of wastewater discharges
- Potential impacts of spread of invasive species
- In-combination Impacts

8.1 Potential impacts from loss of habitat

The proposed development site is not located within a designated site. The habitats recorded within the proposed development site do not correspond to habitats listed on Annex I of the Habitats Directive or to qualifying habitats for the South Dublin Bay SAC and North Dublin Bay SAC.

The arable lands within the proposed development site may provide occasional foraging grounds for SCI species of North Bull Island SPA, South Dublin Bay & River Tolka Estuary SPA and Poulaphuca Reservoir SPA. However, these are common habitats in the vicinity and given the transient use and/or lack of site fidelity any birds which use this site will readily forage at alternative sites nearby. Therefore, the proposed development will not result in any significant deterioration in habitat quality or loss of *ex situ* habitat for SCI species of North Bull Island SPA, South Dublin Bay & River Tolka Estuary SPA and Poulaphuca Reservoir SPA.

The proposed development will not result in any loss of habitat within Natura 2000 sites. The habitats onsite are considered of low value at a local level and are common in the surrounding landscape. No potential for habitat fragmentation has been identified. Thus, no effects on the qualifying interests and conservation of objectives of Natura 2000 site due to habitat loss will occur.

8.2 Potential impacts from noise and disturbance

Potentially increased noise and disturbance associated with the site works could cause disturbance/displacement of fauna. If of sufficient severity, there could be impacts on reproductive success.

The potential effects and impacts of disturbance have been widely recognised in wildlife conservation legislation, as has the need to develop conservation measures for birds whilst taking human activities into account. Article 4.4 of the Bird's Directive (79/409/EEC) requires member states to "*take appropriate steps to avoid… any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article*". This specifically relates to conservation measures concerning Annex I species.

The wintering birds listed as qualifying interests for the North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA are strongly associated with estuarine shoreline areas or wetlands. However, as resources within the SPAs becomes depleted later in the winter, a some of bird species, most notably Light-bellied Brent Goose (*Branta bernicla hrota*) but also terrestrial foraging waders such as Curlew (*Numenius arquata*), switch from inter-tidal foraging to inland feeding on amenity grassland. However, given the distance of the proposed development site from the North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA (>40km) the agricultural lands within or in the vicinity of the proposed development site will not provide a critical resource for SCI species and no impact in predicted to occur.

Greylag Goose and Lesser Black-backed Gull, SCI species for the Poulaphuca Reservoir SPA, could also forage or arable lands on or in the vicinity of the site. The Greylag Goose wintering at Poulaphouca Reservoir mainly use fields at Threecastles to the northeast of Blessington Bridge and roost on the adjacent section of the reservoir, while they may also use fields at Mountseskin in Co. Dublin around 8 km to the north-east, and formerly roosted near Ballymore Eustace, around 5 km to the south-west (Boland and Crowe, 2008). The Greylag Goose wintering at the North Wicklow Coastal Marshes mainly use fields between Newcastle and Killoughter, and also use other areas along the coastal strip, including fields near Leabeg (around 4km to the north) and Broad Lough (around 5km to the south), while they also occasionally roost at Vartry Reservoir around 10km to the west (Boland and Crowe, 2008). Greylag Goose are known to occur within N81, the 10km grid square which overlaps with the proposed development site and may travel between foraging grounds at Poulaphuca Reservoir and the Lower River Suir to the southwest of the proposed development site. However, while Greylag Goose may feed on stubble fields within the proposed development site, given the widespread nature of arable and grassland farming in this area and the distance from known roosting and foraging grounds, the proposed development site does not provide critical foraging habitat for this species.

Lesser Black-backed Gull are transient visitors to arable lands following harvesting. They are generalist, omnivorous species which will readily forage in a range of habitats and the proposed development site does not provide critical foraging habitat for this species.

Given the common nature of habitats onsite and the distance from known foraging grounds for SCI species no effect on bird populations listed as qualifying interests for relevant SPAs is predicted to occur. No impact on any Natura 2000 sites is predicted to occur due to noise and disturbance.

8.3 Potential Impacts of Surface Water Run-off

Potential impacts on aquatic habitats which can arise from this type of development during construction and operation include increased silt levels in surface water run-off and inadvertent spillages of hydrocarbons from fuel and hydraulic fluid.

High levels of silt in surface water run-off from the storage areas, can impact in particular on fish species, in particular salmonids. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced. Impacts on plant and invertebrate communities also has the potential to impact of prey availability for SCI birds.

Elevated silt levels could theoretically, if of sufficient magnitude, result in changes in the ecology of receiving waters. Given the location of the works, the distance of the proposed development from the estuarine environment (>59km downstream), the robust nature of qualifying habitats (e.g. Mudflats and sandflats not covered by seawater at low tide [1140], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (*Glauco-*

Puccinellietalia maritimae) [1330], Mediterranean salt meadows) and the dilution provided in the estuarine/marine environment, impacts on water quality within European sites due to elevated silt levels during construction are highly unlikely to occur.

Inadvertent spillages of hydrocarbons, silt or other chemicals during construction and operation could introduce toxic chemicals into the aquatic environment via surface water run-off and have a direct toxicological impact on habitats and fauna. However, the distance from estuarine/marine environment, the robust nature of qualifying habitats and the dilution provided in the estuarine/marine environment impacts of Natura 2000 sites downstream are highly unlikely.

However, given the proximity of the River Liffey to the proposed development site and the hydrological connection to the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC and North Bull Island SPA, using an abundance of caution and applying the precautionary principle, potential impacts from surface water discharges and possible contamination by hydrocarbons and other chemicals during construction and operation have been screened in for further investigation.

8.4 Potential impacts of wastewater discharges

Once constructed surface and wastewater from the proposed development will be conveyed for treatment to the Upper Liffey Valley Sewerage Scheme WWTP (D0002), which is located approximately 12km downstream of the proposed development site.

Given the hydrological connection to the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA, North Dublin Bay SAC and North Bull Island SPA, using an abundance of caution and applying the precautionary principle, potential impacts from wastewater discharges during operation have been screened in for further investigation.

8.5 Spread of Invasive Species

The third schedule species Himalayan Balsam was recorded within the proposed development site. During construction, best practice measures will be followed to remove this species and prevent its spread within the proposed development site. However, even in the absence of removal and considering the distance upstream, the invasive species recorded within the proposed development site cannot colonise the estuarine/marine habitats for which the South Dublin Bay and North Dublin Bay SACs are designated. Therefore, no potential impacts from invasive species on Natura 2000 sites will occur.

8.6 In-combination Impacts

In-combination impacts refer to a series of individually impacts that may, in combination, produce a significant impact. The underlying intention of this in combination provision is to take account of in-combination impacts from existing or proposed plans and projects and these will often only occur over time.

High negative threats, pressures and activities identified for the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA include roads and motorways, bridges, shipping, urbanised areas, industrial or commercial development, walking, horse-riding, golf courses, land reclamation and accumulation of organic material.

Potential in-combination impacts on the sites may arise owing to an alteration to water quality or quantity. Deterioration in water quality can occur as an indirect consequence of point source or diffuse pollution, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. This leads to potential negative consequences for the qualifying interests that rely on the maintenance of water quality within the Natura 2000 site.

The area surrounding the proposed development is also heavily populated with a mixture of residential properties, commercial units and roads. Wastewater is also discharged from local settlements and industry. This in combination with the proposed development could potentially lead to in-combination impacts within the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA. Applying an abundance of caution further investigation is also required to determine if increased surface water and wastewater discharges will have an in-combination impact on the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA.

9. Screening conclusion and statement

This AA screening report has been prepared to assess whether the proposed development, individually or in-combination with other plans or projects, and in view of best scientific knowledge, is likely to have a significant effect on any European site(s).

The screening exercise was completed in compliance with the relevant European Commission guidance, national guidance, and case law. The potential impacts of the proposed development have been considered in the context of the European sites potentially affected, their qualifying interests or special conservation interests, and their conservation objectives.

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the proposed development and the potential in-combination effects with other plans or projects, the following findings were reported:

Although the likelihood of effects on the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA is low, using an abundance of caution potential impact pathways have been identified and a NIS is being prepared for the proposed development.

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Appendices

Appendix 1. Natura 2000 Site Synopses

Site Name: North Dublin Bay SAC

Site Code: 000206

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site.

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
- [1210] Annual Vegetation of Drift Lines
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2110] Embryonic Shifting Dunes
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [2190] Humid Dune Slacks
- [1395] Petalwort (Petalophyllum ralfsii)

North Bull Island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (Ammophila arenaria) is dominant on the outer dune ridges, with Lyme-grass (Leymus arenarius) and Sand Couch (Elymus farctus) on the foredunes. Behind the first dune ridge, plant diversity increases with the appearance of such species as Wild Pansy (Viola tricolor), Kidney Vetch (Anthyllis vulneraria), Common Bird's-foot-trefoil (Lotus corniculatus), Common Restharrow (Ononis repens), Yellow-rattle (Rhinanthus minor) and Pyramidal Orchid (Anacamptis pyramidalis). In these grassy areas and slacks, the scarce Bee Orchid (Ophrys apifera) occurs.

About 1 km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees (Alnus glutinosa). The water table is very near the surface and is only slightly brackish. Saltmarsh Rush (Juncus maritimus) is the dominant species, with Meadowsweet (Filipendula ulmaria) and Devil's-bit Scabious (Succisa pratensis) being frequent. The orchid flora is notable and includes Marsh Helleborine (Epipactis palustris), Common Twayblade (Listera ovata), Autumn Lady's-tresses (Spiranthes spiralis) and Marsh Orchids (Dactylorhiza spp.).

Saltmarsh extends along the length of the landward side of the island. The edge of the marsh is marked by an eroding edge which varies from 20 cm to 60 cm high. The marsh can be zoned into different levels according to the vegetation types present. On the lower marsh, Glasswort (Salicornia europaea), Common Saltmarsh-grass (Puccinellia maritima), Annual Sea-blite (Suaeda maritima) and Greater Sea-spurrey (Spergularia media) are the main species. Higher up in the middle marsh Sea Plantain (Plantago maritima), Sea Aster (Aster tripolium), Sea Arrowgrass (Triglochin maritima) and Thrift (Armeria maritima) appear. Above the mark of the normal high tide, species such as Common Scurvygrass (Cochlearia officinalis) and Sea Milkwort (Glaux maritima) are found, while on the extreme upper marsh, the rushes Juncus maritimus and J. gerardi are dominant. Towards the tip of the island, the saltmarsh grades naturally into fixed dune vegetation.

The habitat ‘annual vegetation of drift lines’ is found in places, along the length of Dollymount Strand, with species such as Sea Rocket (Cakile maritima), Oraches (Atriplex spp.) and Prickly Saltwort (Salsola kali).

The island shelters two intertidal lagoons which are divided by a solid causeway. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. The north lagoon has an area known as the "Salicornia flat", which is dominated by Salicornia dolichostachya, a pioneer glasswort species, and covers about 25 ha. Beaked Tasselweed (Ruppia maritima) occurs in this area, along with some Narrow-leaved Eelgrass (Zostera angustifolia). Dwarf Eelgrass (Z. noltii) also occurs in Sutton Creek. Common Cordgrass (Spartina anglica) occurs in places but its growth is controlled by management. Green algal mats (Enteromorpha spp., Ulva lactuca) cover large areas of the flats during summer. These sediments have a rich macrofauna, with high densities of Lugworms (Arenicola marina) in parts of the north lagoon. Mussels (Mytilus edulis) occur in places, along with bivalves such as Cerastoderma edule, Macoma balthica and Scrobicularia plana. The small gastropod Hydrobia ulvae occurs in high densities in places, while the crustaceans Corophium volutator and Carcinus maenas are common. The sediments on the seaward side of North Bull Island are mostly sands. The site extends below the low spring tide mark to include an area of the sublittoral zone.

Three rare plant species which are legally protected under the Flora (Protection) Order, 1999 have been recorded on the North Bull Island. These are Lesser Centaury (Centaurium pulchellum), Red Hemp-nettle (Galeopsis angustifolia) and Meadow Saxifrage (Saxifraga granulata). Two further species listed as threatened in the Red Data Book, Wild Clary/Sage (Salvia verbenaca) and Spring Vetch (Vicia lathyroides), have also been recorded. A rare liverwort, Petalophyllum ralfsii, was first recorded from the North Bull Island in 1874 and has recently been confirmed as still present. This species is of high conservation value as it is listed on Annex II of the E.U. Habitats Directive. The North Bull is the only known extant site for the species in Ireland away from the western seaboard.

North Dublin Bay is of international importance for waterfowl. During the 1994/95 to 1996/97 period the following species occurred in internationally important numbers (figures are average maxima): Brent Goose 2,333; Knot 4,423; Bar-tailed Godwit 1,586. A further 14 species occurred in nationally important concentrations - Shelduck 1505; Wigeon 1,166; Teal 1,512; Pintail 334; Shoveler 239; Oystercatcher 2,190; Ringed Plover 346; Grey Plover 816; Sanderling 357; Dunlin 6,238; Black-tailed Godwit 156; Curlew 1,193; Turnstone 197 and Redshank 1,175. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling and Dunlin).

The tip of the North Bull Island is a traditional nesting site for Little Tern. A high total of 88 pairs nested in 1987. However, nesting attempts have not been successful since the early 1990s. Ringed Plover, Shelduck, Mallard, Skylark, Meadow Pipit and Stonechat also nest. A well-known population of Irish Hare is resident on the island.

The invertebrates of the North Bull Island have been studied and the island has been shown to contain at least seven species of regional or national importance in Ireland (from the Orders Diptera, Hymenoptera and Hemiptera).

The main land uses of this site are amenity activities and nature conservation. The North Bull Island is the main recreational beach in Co. Dublin and is used throughout the year. Much of the land surface of the island is taken up by two golf courses. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrrounding intertidal flats. The site is used regularly for educational purposes. North Bull Island has been designated a Special Protection Area under the E.U. Birds Directive and it is also a statutory Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site.

This site is an excellent example of a coastal site with all the main habitats represented. The site holds good examples of nine habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.

Site Name: South Dublin Bay SAC

Site Code: 000210

This site lies south of the River Liffey in Co. Dublin, and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion Gates. The main channel which drains the area is Cockle Lake.

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
- [1210] Annual vegetation of drift lines
- [1310] Salicornia and other annuals colonising mud and sand
- [2110] Embryonic shifting dunes

The bed of Dward Eelgrass (Zostera noltii) found below Merrion Gates is the largest stand on the east coast. Green algae (Enteromorpha spp. and Ulva lactuca) are distributed throughout the area at a low density. Fucoid algae occur on the rocky shore in the Maretimo to Dún Laoghaire area. Species include Fucus spiralis, F. vesiculosus, F. serratus, Ascophyllum nodosum and Pelvetia canaliculata.

Several small, sandy beaches with incipient dune formation occur in the northern and western sectors of the site, notably at Poolbeg, Irishtown and Merrion/ Booterstown. The formation at Booterstown is very recent. Drift line vegetation occurs in association with the embryonic and incipient fore dunes. Typically drift lines occur in a band approximately 5 m wide, though at Booterstown this zone is wider in places. The habitat occurs just above the High Water Mark and below the area of embryonic dune. Species present are Sea Rocket (Cakile maritima), Frosted Orache (Atriplex laciniata), Spear-leaved Orache (A. prostrata), Prickly Saltwort (Salsola kali) and Fat Hen (Chenopodium album). Also occurring is Sea Sandwort (Honkenya peploides), Sea Beet (Beta vulgaris subsp. maritima) and Annual Sea-blite (Suaeda maritima). A small area of pioneer saltmarsh now occurs in the lee of an embryonic sand dune just north of Booterstown Station. This early stage of saltmarsh development is here characterised by the presence of pioneer stands of glassworts (Salicornia spp.) occurring below an area of drift line vegetation. As this is of very recent origin, it covers a small area but ample areas of substrate and shelter are available for the further development of this habitat.

Lugworm (Arenicola marina), Cockles (Cerastoderma edule) and annelids and other bivalves are frequent throughout the site. The small gastropod Hydrobia ulvae occurs on the muddy sands off Merrion Gates.

South Dublin Bay is an important site for waterfowl. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. The principal species are Oystercatcher (1215), Ringed Plover (120), Sanderling (344), Dunlin (2628) and Redshank (356) (average winter peaks 1996/97 and 1997/98). Up to 100 Turnstones are usual in the south bay during winter. Brent Goose regularly occur in numbers of international importance (average peak 299). Bar-tailed Godwit (565), a species listed on Annex I of the E.U. Birds Directive, also occur.

Large numbers of gulls roost in South Dublin Bay, e.g. 4,500 Black-headed Gulls in February 1990; 500 Common Gulls in February 1991. It is also an important tern roost in the autumn, regularly holding 2000-3000 terns including Roseate Terns, a species listed on Annex I of the E.U. Birds Directive. South Dublin Bay is largely protected as a Special Protection Area.

At low tide the inner parts of the south bay are used for amenity purposes. Baitdigging is a regular activity on the sandy flats. At high tide some areas have windsurfing and jet-skiing.

This site is a fine example of a coastal system, with extensive sand and mudflats, and incipient dune formations. South Dublin Bay is also an internationally important bird site.

Site Name: South Dublin Bay and River Tolka Estuary SPA

Site Code: 004024

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included.

In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. There is a bed of Dwarf Eelgrass (Zostera noltii) below Merrion Gates which is the largest stand on the east coast. Green algae (Ulva spp.) are distributed throughout the area at a low density. The macroinvertebrate fauna is well-developed, and is characterised by annelids such as Lugworm (Arenicola marina), Nephthys spp. and Sand Mason (Lanice conchilega), and bivalves, especially Cockle (Cerastoderma edule) and Baltic Tellin (Macoma balthica). The small gastropod Spire Shell (Hydrobia ulvae) occurs on the muddy sands off Merrion Gates, along with the crustacean Corophium volutator. Sediments in the Tolka Estuary vary from soft thixotrophic muds with a high organic content in the inner estuary to exposed, well-aerated sands off the Bull Wall. The site includes Booterstown Marsh, an enclosed area of saltmarsh and muds that is cut off from the sea by the Dublin/Wexford railway line, being linked only by a channel to the east, the Nutley stream. Sea water incursions into the marsh occur along this stream at high tide. An area of grassland at Poolbeg, north of Irishtown Nature Park, is also included in the site.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex – all counts for wintering waterbirds are five year mean peaks for the period 1995/96 to 1999/2000. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. An internationally important population of Light-bellied Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the Eelgrass bed at Merrion. At the time of designation the site supported nationally important numbers of a further nine species: Oystercatcher (1,145), Ringed Plover (161), Grey Plover (45), Knot (548), Sanderling (321), Dunlin (1,923), Bar-tailed Godwit (766), Redshank (260) and Black-headed Gull (3,040). Other species occurring in smaller numbers include Great Crested Grebe (21), Curlew (127) and Turnstone (52). Little Egret, a species which has recently colonised Ireland, also occurs at this site.

South Dublin Bay is a significant site for wintering gulls, with a nationally important population of Black-headed Gull, but also Common Gull (330) and Herring Gull (348). Mediterranean Gull is also recorded from here, occurring through much of the year, but especially in late winter/spring and again in late summer into winter.

Both Common Tern and Arctic Tern breed in Dublin Docks, on a man-made mooring structure known as the E.S.B. dolphin – this is included within the site. Small numbers of Common Tern and Arctic Tern were recorded nesting on this dolphin in the 1980s. A survey in 1995 recorded nationally important numbers of Common Tern nesting here (52 pairs). The breeding population of Common Tern at this site has increased, with 216 pairs recorded in 2000. This increase was largely due to the ongoing management of the site for breeding terns. More recent data highlights this site as one of the most important Common Tern sites in the country with over 400 pairs recorded here in 2007.

South Dublin Bay is an important staging/passage site for a number of tern species in the autumn (mostly late July to September). The origin of many of the birds is likely to be the Dublin breeding sites (Rockabill and the Dublin

Docks) though numbers suggest that the site is also used by birds from other sites, perhaps outside the state. This site is selected for designation for its autumn tern populations: Roseate Tern (2,000 in 1999), Common Tern (5,000 in 1999) and Arctic Tern (20,000 in 1996).

The South Dublin Bay and River Tolka Estuary SPA is of ornithological importance as it supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further nine wintering species. Furthermore, the site supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for three tern species. It is of note that four of the species that regularly occur at this site are listed on Annex I of the E.U. Birds Directive, i.e. Bar-tailed Godwit, Common Tern, Arctic Tern and Roseate Tern. Sandymount Strand/Tolka Estuary is also a Ramsar Convention site.

Site Name: North Bull Island SPA

Site Code: 004006

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses.

Saltmarsh extends along the length of the landward side of the island and provides the main roost site for wintering birds in Dublin Bay. The island shelters two intertidal lagoons which are divided by a solid causeway. These lagoons provide the main feeding grounds for the wintering waterfowl. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. Green algal mats (Ulva spp.) are a feature of the flats during summer. These sediments have a rich macro-invertebrate fauna, with high densities of Lugworm (Arenicola marina) and Ragworm (Hediste diversicolor).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. The site supports internationally important populations of three species, Light-bellied Brent Goose (1,548), Black-tailed Godwit (367) and Bar-tailed Godwit (1,529) - all figures are mean peaks for the five winters between 1995/96 and 1999/2000. The site is one of the most important in the country for Light-bellied Brent Goose. A further 14 species have populations of national importance – Shelduck (1,259), Teal (953), Pintail (233), Shoveler (141), Oystercatcher (1,784), Grey Plover (517), Golden Plover (2,033), Knot (2,837), Sanderling (141), Dunlin (4,146), Curlew (937), Redshank (1,431), Turnstone (157) and Black-headed Gull (2,196). The populations of Pintail and Knot are of particular note as they comprise 14% and 10% respectively of the all-Ireland population totals. Other species that occur regularly in winter include Grey Heron, Little Egret, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser, Ringed Plover and Greenshank. Gulls are a feature of the site during winter and, along with the nationally important population of Black-headed Gull (2,196), other species that occur include Common Gull (332) and Herring Gull (331). While some of the birds also frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter. The wintering bird populations have been monitored more or less continuously since the late 1960s and the site is now surveyed each winter as part of the larger Dublin Bay complex.

The North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter.

The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Several pairs of Ringed Plover breed, along with Shelduck in some years. Breeding passerines include Skylark, Meadow Pipit, Stonechat and Reed Bunting. The island is a regular wintering site for Short-eared Owl, with up to 5 present in some winters.

The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl. North Bull Island is a Ramsar Convention site, and part of the North Bull Island SPA is a Statutory Nature Reserve and a Wildfowl Sanctuary.

SITE NAME: POULAPHOUCA RESERVOIR SPA SITE CODE: 004063

Poulaphouca Reservoir SPA, located in the western foothills of the Wicklow Mountains, was created in 1944 by damming of the River Liffey for the purpose of generating electricity from hydropower. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mid- east and south-east regions. The reservoir receives water from two main sources, the River Liffey at the northern end, and the Kings River at the southern end. The exit is into the River Liffey gorge at the western end. Underlying the reservoir are sands and gravels deposited during the last glaciation. The shores of the lake are mostly sandy. When water levels are low the exposed lake muds are colonised by an ephemeral flora of annual plant species. Wet grassland areas occur in sheltered bays around the lake but especially in the northern part. Reed Canary-grass (Phalaris arundinacea) is the main grass species present, but other plant species characteristic of wet grasslands occur, including Creeping Bent (Agrostis stolonifera), Meadowsweet (Filipendula ulmaria), Yellow Iris (Iris pseudacorus) and Water Mint (Mentha aquatica). Sedges (Carex spp.) are locally common, while Rusty Willow (Salix cinerea subsp. oleifolia) scrub is often found associated with the wet grassland. In some places the water washes against grassy banks which are generally less than a metre high, and in a few places there are steep sand and clay cliffs, up to 15 m high - these are remnants of the old River Liffey channel. In many places the banks are actively eroding, and a strip of conifers has been planted around much of the perimeter of the reservoir in an attempt to stabilize the banks.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Greylag Goose and Lesser Black- backed Gull.

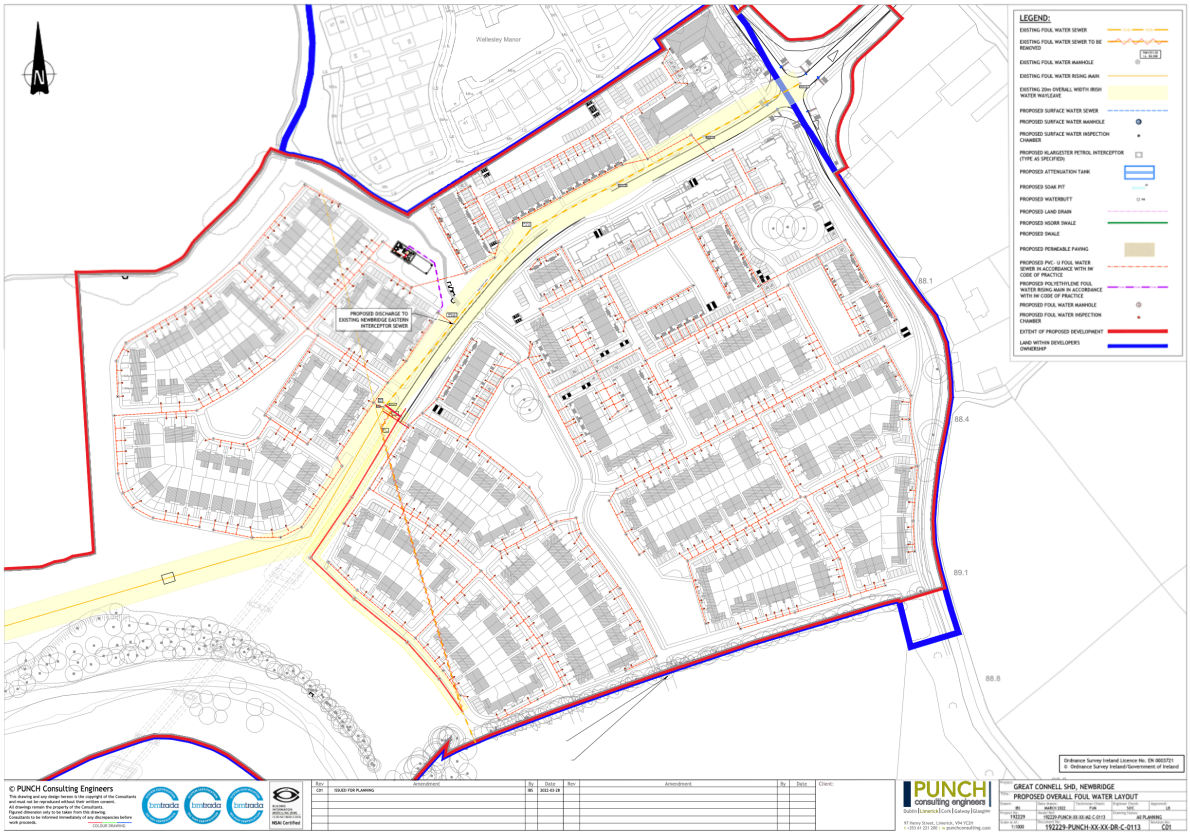
Poulaphouca Reservoir is of national importance for its Greylag Goose population, which is one of the largest in the country. The site provides the main roost for the birds, with feeding occurring mostly on improved grassland outside of the site. A mean peak of 701 individuals occurred during the five seasons 1995/96 to 1999/2000. Other waterfowl species occur in relatively low numbers, including Whooper Swan (22), Wigeon (180), Teal (107), Mallard (186), Goldeneye (22), Cormorant (11), Great Crested Grebe (8), Curlew (86) and Mute Swan (11). The site is also used by Grey Heron (6).

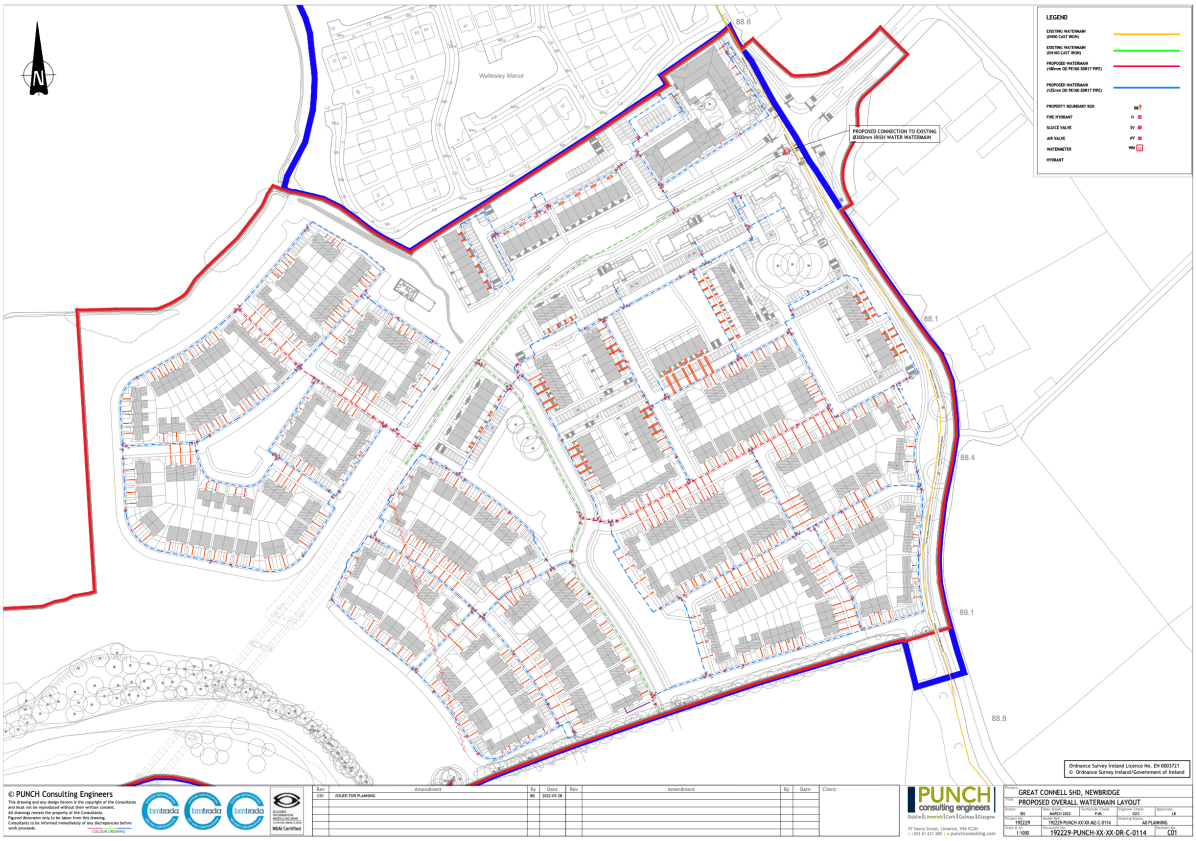
The reservoir attracts roosting gulls during winter, most notably a large population of Lesser Black-backed Gull (651), which in Ireland is rare in winter away from the south coast. Black-headed Gull (915) and Common Gull (183) also occur.

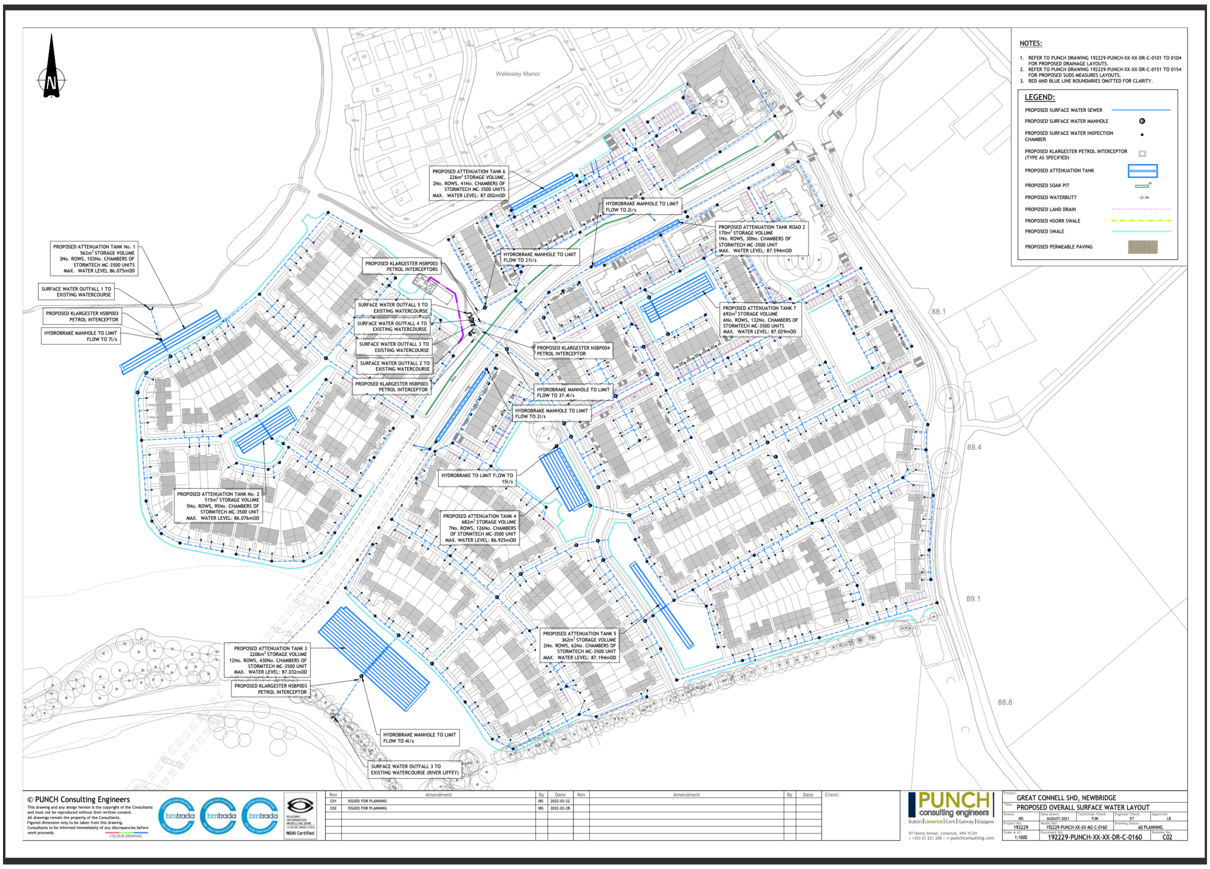
Breeding birds at the site include Great Crested Grebe (several pairs), which is localised in its distribution in eastern Ireland, as well as Snipe and Lapwing.

The principal interest of the site is the Greylag Goose population, which is of national importance. A range of other wildfowl species also occurs, including Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull. Part of Poulaphouca Reservoir SPA is a Wildfowl Sanctuary.

Appendix 2. Drawings






NOTES:
1. REFER TO PUNCH DRAWING 192229-PUNCH-XX-XX-DR-C-0101 TO 0104 FOR PROPOSED DRAINAGE LAYOUTS.
2. REFER TO PUNCH DRAWING 192229-PUNCH-XX-XX-DR-C-0151 TO 0154 FOR PROPOSED SUDS MEASURES LAYOUTS.
3. RED AND BLUE LINE BOUNDARIES OMITTED FOR CLARITY.
LEGEND:
PROPOSED SURFACE WATER SEWER
PROPOSED SURFACE WATER MANHOLE
PROPOSED SURFACE WATER INSPECTION CHAMBER
PROPOSED KLARGESTER PETROL INTERCEPTOR (TYPE AS SPECIFIED)
PROPOSED ATTENUATION TANK
PROPOSED SOAK PIT
PROPOSED WATERBUTT
PROPOSED LAND DRAIN
PROPOSED NSORR SWALE
PROPOSED SWALE
PROPOSED PERMEABLE PAVING
Wellesley Manor
88.1
88.4
89.1
88.8
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Title: PROPOSED OVERALL SURFACE WATER LAYOUT
Drawn: IBS
Date drawn: AUGUST 2021
Technician Check: PJM
Engineer Check: ET
Approved: LB
Project No: 192229
Model Ref: 192229-PUNCH-XX-XX-M2-C-0160
Drawing Status: A0 PLANNING
Scale @ A1: 1:1000
Document No: 192229-PUNCH-XX-XX-DR-C-0160
Revision No: C02