



Natura Impact Statement
for a Strategic Housing Development at lands in Abingdon, Shankill,
Co. Dublin.

prepared for ES Shan Limited

Scott Cawley, College House, 71 – 73 Rock Road, Blackrock, Co. Dublin, A94 F9X9, Ireland

Tel+353(1)676-9815 Fax +353(1) 676-9816

Document Control

Project Title	Abingdon Residential Development, Shankill, Co. Dublin	Project No.	190112	
Document Title	Natura Impact Statement	Status	Final	
Revision	Issue Date	Author	Reviewed By	Approved By
I2	06/10/2020	LG	ACr	ACr

© Copyright Scott Cawley Limited.

This report has been prepared by Scott Cawley Ltd. for the sole use of our client (the 'Client') and, unless otherwise agreed in writing by Scott Cawley Ltd., no other party may use, make use of or rely on the contents of this report. No liability is accepted by Scott Cawley Ltd. for any use of this report, other than the purpose for which it was prepared.

This report has been prepared by Scott Cawley Ltd. in accordance with the particular instructions and requirements of our agreement with the Client, the project's budgetary and time constraints and in line with best industry standards. The methodology adopted and the sources of information used by Scott Cawley Ltd. in providing its services are outlined in this report. The scope of this report and the services are defined by these circumstances.

Where the conclusions and recommendations contained within this document are based upon information provided by others than Scott Cawley Ltd., no liability is accepted on the validity or accuracy of that information. It is assumed that all relevant information has been provided by those parties from whom it has been requested and that the information is true and accurate. No independent verification of any documentation or information supplied by others has been made.

The conclusions presented in this report represent Scott Cawley Ltd.'s best professional judgement based on review of site conditions observed during the site visit (if applicable) and the relevant information available at the time of writing. Scott Cawley Ltd. has used reasonable skill, care and diligence in compiling this report and no warranty is provided as to the report's accuracy.

Table of Contents

1	Introduction	1
2	Legislative Context.....	1
3	Methodology	2
3.1	Scientific and Technical Competence Relied Upon.....	2
3.2	Guidance and Approach.....	3
3.3	Assessment Methodology.....	4
3.4	Desktop Study	5
3.5	Consultations	5
3.6	Baseline Surveys.....	5
4	Description of the Proposed Development	7
5	Overview of the Receiving Environment	8
5.1	European Sites	8
6	Potential Impacts, Zone of Influence and Identifying European Sites at Risk of Effects	17
6.1	Habitat degradation as a result of hydrological impacts	17
6.2	Habitat degradation as a result of hydrogeological impacts	17
6.3	Habitat degradation as a result of introducing/spreading non-native invasive species.....	18
6.4	Summary	18
7	Assessment of Effects on European Sites	19
7.1	Dalkey Islands SPA.....	19
7.2	Rockabill to Dalkey Island SAC	32
7.3	All Other European Sites	36
8	In Combination Assessment	37
8.1	Analysis of Potential In Combination Effects	37
8.2	Conclusion of In Combination Assessment.....	38
9	NIS Conclusion	38

Appendix I

Winter Bird Survey Conditions Summary

Appendix II

Desk Study Flora and Fauna Records

1 Introduction

- 1 This report has been prepared by Scott Cawley Ltd. for the applicant, ES Shan Limited, who is seeking permission for a Strategic Housing Development at lands in Abingdon, Shankill, Co. Dublin (hereinafter referred to as the proposed development).
- 2 This NIS has been prepared in accordance with the provisions of Part XAB of the Planning and Development Act, 2000 (as amended) and in accordance with the requirements of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive).
- 3 It considers the implications of the proposed development, on its own and in combination with other plans or projects, for European sites¹ in view of the conservation objectives of those sites. It includes a scientific examination of evidence and data to identify and assess the implications of the proposed development for any European sites in view of the conservation objectives of those sites. It considers whether the proposed development, by itself and in combination with other plans or projects, would adversely affect the integrity of any European sites. In reaching a conclusion in this regard consideration is given to any mitigation measures necessary to avoid or reduce any potential negative impacts.
- 4 The purpose of this NIS is to provide an examination, analysis and evaluation of the potential impacts of the proposed development on European sites and to present findings and conclusions with respect to the proposed development in light of the best scientific knowledge in the field. This NIS will inform and assist the competent authority, An Bord Pleanála, in carrying out its Appropriate Assessment as to whether or not the proposed development will adversely affect the integrity of any European sites, either alone or in combination with other plans and projects, taking into account their conservation objectives.
- 5 The proposed development is neither connected with nor necessary to the management of any European sites.

2 Legislative Context

- 6 The Birds and Habitats Directives - Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) – require Ireland to establish protected sites as part of a European wide network of sites (the Natura 2000 network which are known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). SACs are selected for habitats listed on Annex I of the Habitats Directive (including priority Annex I habitat types which are in danger of disappearance) and species listed on Annex II. SPAs are selected for bird species (listed on Annex I of the Birds Directive), regularly-occurring populations of migratory bird species (such as ducks, geese and waders), and areas of international importance for migratory birds. The specified habitats and species for which each SAC and SPA is selected, correspond to the qualifying interests (in the case of SACs) or special conservation interest species (in the case of SPAs) for the sites, for which conservation objectives are prepared.
- 7 Article 6(3) of the Habitats Directive states that:

¹ The Natura 2000 network of sites are defined under the Habitats Directive (Article 3) as a European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and species listed in Annex II, and special protection areas classified pursuant to the Birds Directive (2009/147/EC). The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland, these sites are designed as *European sites* – as defined under the Planning and Development Acts and/or Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

'Any plan or project not directly connected with or necessary to the management of the 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. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'

- 8 This provision is transposed into Irish law by Part XAB of the Planning and Development Acts 2000 as amended. Section 177U(4) of the said Acts provides for screening for Appropriate Assessment as follows:

'The competent authority shall determine that an appropriate assessment of [...] a proposed development [...] 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.'

- 9 Section 177U(5) provides as follows:

'The competent authority shall determine that an appropriate assessment of a [...] proposed development, [...], is not required if it can 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.'

- 10 Section 177T(1) and (2) provide that a NIS is 'a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites' and specifies that it 'shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites'.

- 11 The Court of Justice of the European Union (CJEU) has made a number of rulings in relation to Appropriate Assessment, regarding when it is required, its purpose and the standards it should meet. Two of the key rulings include, Case C-127/02 Waddenzee where the CJEU found that 'Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects' and that the plan or project may only be authorised 'where no reasonable scientific doubt remains as to the absence of such effects', and Case C-258/11 where the CJEU found that '[The Appropriate Assessment] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned'.

- 12 Consideration has been given in the preparation of this report, to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

3 Methodology

3.1 Scientific and Technical Competence Relied Upon

- 13 This NIS was authored by Lorna Gill and reviewed by Ashling Cronin MEnvSc Technical Director of Scott Cawley Ltd. The background and experience of the author and contributors to this report are set out below.
- 14 Lorna Gill is a Consultant Ecologist with Scott Cawley. Lorna holds an MSc in Conservation and Biodiversity from the University of Exeter and an honours degree in Natural Sciences with a specialisation in Zoology from Trinity College Dublin. Lorna is experienced in carrying out field surveys in Ireland including wintering birds, breeding birds, bats and other protected mammals. Other experience includes monitoring badger sett closures, radiotracking bats, manual bat call analysis and the use of GIS software. At Scott Cawley,

Lorna's work also includes data analysis and the preparation of Appropriate Assessment reports and Ecological Impact Assessments for residential and other commercial projects across the country.

- 15 Ashling is a Technical Director with Scott Cawley. She holds a Masters in Ecological Assessment, an honours degree in Applied Ecology from University College Cork and an Advanced Diploma in Planning and Environmental Law from Kings Inns. She has over ten years' experience in environmental management and environmental / ecological assessment across both the private and public sector. Ashling has provided environmental and ecological support on a variety of planning applications including Strategic Infrastructure Developments (ports and roads), wind farm developments, utilities infrastructure, small to large scale industrial, commercial, residential and mixed use developments. Ashling has a keen interest in both national and international environmental legislation and has extensive experience in the Appropriate Assessment (AA) process. She has been the lead ecologist for the preparation of a number of Natura Impact Statements for a range of development types and national plans, and Natura Impact Reports for a range of land use plans. Ashling also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision making process as well as peer review of AA documentation prior to lodgement of planning applications.

3.2 Guidance and Approach

- 16 This NIS has been prepared having regard to the following documents.

European Commission Guidance

- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2001)
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2019)
- *Communication from the Commission on the Precautionary Principle* (European Commission 2000)²
- *Nature and Biodiversity Cases – Ruling of the European Court of Justice* (European Commission 2006)
- *Article 6 of the Habitats Directive – Rulings of the European Court of Justice* (European Commission Final Draft September 2014)

Irish Guidance

- *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 & PSSP 2/10* (NPWS, 2010)

² The precautionary principle is a guiding principle that derives from Article 191 of the Treaty on the Functioning of the European Union and has been developed in the case law of the European Court of Justice (e.g. ECJ case C-127/02 – Waddenzee, Netherlands).

This guidance document notes that the precautionary principle “covers those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection”.

Applying the precautionary principle in the context of screening for appropriate assessment requires that where there is uncertainty or doubt about the risk of significant effects on a European site(s), it should be assumed that significant effects are likely and AA must be carried out.

17 In addition, regard has been had to the following guidance in characterising impacts, including determining magnitude and significance of impacts, as relevant in the application to Appropriate Assessment and European sites:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (Chartered Institute of Ecology and Environmental Assessment, 2018)

3.3 Assessment Methodology

18 The proposed development (including the proposed design, construction methodologies and operational effects) was analysed and assessed to identify the potential impacts associated with the proposed development that could affect the ecological environment.

19 From this, the zone of influence of the proposed development was defined. Based on the identified impacts, and their zone of influence, the European sites potentially at risk of any direct or indirect impacts were identified.

20 In establishing which European sites are potentially at risk (in the absence of mitigation) from the proposed development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

21 The identification of source-pathway-receptor connection(s) between the proposed development and European sites essentially is the process of identifying which European sites are within the zone of influence of the proposed development, and therefore potentially at risk of significant effects. The zone of influence is defined as the area within which the proposed development could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).

22 The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood of significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where there is uncertainty, the precautionary principle has been applied.

23 This assessment has been undertaken in consideration of all potential impact sources and pathways connecting the proposed development to European sites, in view of the conservation objectives supporting the conservation condition of the sites' QIs/SCIs.

24 The conservation objectives relating to each European site and its QIs/SCIs are expressed generally for SACs as "to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected", and for SPAs "to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA".

25 Following on from this, and as defined in the Habitats Directive, favourable conservation status (or condition, at a site level) of a habitat is achieved when:

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

26 The favourable conservation status (or condition, at a site level) of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
 - the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
 - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis
- 27 Where site-specific conservation objectives have been prepared for a given European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can be measured, i.e. an impact which affects the achievement of favourable conservation condition, as measured by the attributes and targets, is an impact on site integrity.
- 28 In the case of some QIs/SCIs in certain European sites, the conservation objective is to restore rather than maintain conservation condition and this distinction is taken into account in the assessment; as is any legacy damage to European sites that has occurred since their designation, insofar as possible.

3.4 Desktop Study

- 29 The desktop data sources used to inform the assessment presented in this report are as follows (accessed on the 07 July 2020):
- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie, including conservation objectives documents
 - Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie
 - Information on the surface water network and surface water quality in the area available from www.epa.ie
 - Information on groundwater resources and groundwater quality in the area available from www.epa.ie and www.gsi.ie
 - Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie
 - Information on the location, nature and design of the proposed development supplied by the applicant's design team
 - Dun Laoghaire Rathdown (2016) *Dun Laoghaire Rathdown County Development Plan 2016-2022*

3.5 Consultations

- 1 A consultation letter was submitted by email to the Development Applications Unit on 21 July 2020. The letter included an outline description of the proposed development, and a request for any comments on the proposal. No response was been received by Scott Cawley prior to submission of the planning application for the proposed development.

3.6 Baseline Surveys

- 2 This section describes the methodologies followed for the ecological surveys undertaken on the proposed development site, some of which inform the assessment presented in this NIS. A summary of all ecological surveys carried out at the proposed development site is listed below in Table 1.

Table 1: Ecological surveys and survey dates

Survey	Survey Date(s)
Habitat surveys	03 July 2020
Terrestrial Mammal Survey (excl. bats)	11 April 2019
Wildlife camera monitoring ³ :	08 February – 10 March 2020
Winter Bird Surveys	27 January 2020 07 February 2020 24 February 2020 10 March 2020 23 March 2020
Breeding Bird Surveys	20 May 2020 03 June 2020 29 June 2020
Bat activity surveys:	
<ul style="list-style-type: none"> • Static detectors deployed 	25 September – 09 October 2019
<ul style="list-style-type: none"> • Post-dusk roost emergence and activity survey 	01 October 2019 09 October 2019 02 June 2020
<ul style="list-style-type: none"> • Pre-dawn roost re-entry and activity survey 	19 June 2020

3.6.1 Habitats and Flora

- 3 A habitat survey was undertaken of the proposed development site on the 03 July 2020 by Lorna Gill of Scott Cawley Ltd. following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*⁴. All habitat types were classified using the *Guide to Habitats in Ireland*⁵, recording the indicator species and abundance using the DAFOR scale⁶ and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*⁷, having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*⁸ and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*⁹. Annex I habitat

³ Carried out under NPWS wildlife photography licence 007/2020

⁴ Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

⁵ Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

⁶ The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

⁷ Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

⁸ Stace, C. (2019) *New Flora of the British Isles. 4th Edition*. C&M Floristics.

⁹ Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

types were classified after the *Interpretation manual of European Union Habitats EUR28*¹⁰ with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable. The nomenclature for Annex I habitats follows that of the *Interpretation manual of European Union Habitats EUR28* with abbreviated names after those used in *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*¹¹.

3.6.2 Fauna Surveys

3.6.2.1 Wintering Birds

- 4 Wintering bird surveys were undertaken on 27 January, 07 February, 24 February, 10 March and 26 March by Lorna Gill and Shane Brien of Scott Cawley Ltd. using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. Lands were initially surveyed visually using binoculars/scope from a vantage point(s) at the edge of the study area followed by a walkover of the area to identify birds which may not be visible from a distance (e.g. waders) and to identify evidence of usage by wildfowl such as swans or geese (e.g. droppings and feathers). Transects were undertaken to look for goose droppings, see Figure 2. Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes. Weather conditions and recorded disturbance events are presented in Appendix IV.

3.6.3 Survey Limitations

- 5 Winter bird surveys were undertaken during the second half of the winter season, from January to March 2020. Due to the fortnightly frequency of visits during the survey period and the sites suitability for winter birds, this is not considered to be a limitation to the survey results.
- 6 The bat surveys carried out in 2019 were considered to be carried out in optimal weather conditions for bat activity, October is on the shoulder of the activity season and level of activity at this time of year is dependent on weather (Collins, 2016). Given surveys were carried out in optimal weather conditions undertaking them in October to identify activity within the site is not considered to be a constraint. Additionally, the 2020 surveys were undertaken during the main bat activity season.
- 7 Despite the limitations noted above, sufficient survey data was gathered to fully inform the assessment of impacts, the mitigation measures described in this report and the assessment of residual impacts predicted in relation to the proposed development.

4 Description of the Proposed Development

- 8 The proposed development will consist of a 'Build to Rent' residential scheme comprising 193 no. apartments within four no. blocks ranging in height up to eight storeys. The development will also include a residents pavilion, residential amenities areas, car, cycle and motorcycle parking. Vehicular connection via Clifton Park. Provision of additional pedestrian/cyclist accesses including to Shanganagh Park. All associated site development works and services provisions including bin storage areas, substations/switch rooms, plant areas, open spaces, boundary treatments, landscaping and all services required to facilitate the proposed development. A detailed development description is included the statutory notices.
- 9 A new surface water sewer network shall be provided for the proposed development which will be entirely separated from the foul water sewer network. All surface water run-off from roof areas and hardstanding areas are designed to be collected by a gravity pipe network. The network will discharge to the south-east

¹⁰ CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28*. European Commission, DG Environment.

¹¹ NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*. Unpublished NPWS report.

corner of the site to an existing surface water main on Clifton Park. This public surface water drain discharges to the Loughlinstown River also known as the Shanganagh River.

- 10 Sustainable Urban Drainage Systems (SuDS) proposed for the site include:
- Two attenuation tanks - to attenuate flows up to a 1 in 100-year storm event with a 10% allowance for climate change, located in the south-east corner of the site under the access road;
 - Green roofs - the total proportion of green roofs provided will be a minimum of 60% of the total roof area of the proposed development in accordance with the County Development Plan;
 - Green podium – two podium areas are proposed to have an intensive green podium area;
 - Permeable pavements - the car parking bays on site are proposed as permeable pavements. The use of permeable pavers for car parking areas not under the podium is proposed in lieu of an oil separator;
 - Tree pits – interception design of tree root system (bio retention areas), pavements drained by tree root systems can be considered to provide Interception;
 - Rain gardens - a large proportion of pavement surfaces are to runoff overland to rain gardens. These tree rain garden systems provide interception and treatment prior to entering the drainage network;
 - A petrol inceptor - located upstream of the proposed attenuation tanks; and,
 - Soft landscape - to reduce the run-off generated from the site.
- 11 The proposed foul water sewer will discharge by gravity to the south-east corner of the site along the proposed access road. It will connect to the existing foul sewer network and the 225mm concrete pipe. During operation, foul water generated by the proposed development comprising 521.1 Population Equivalent (P.E.) will ultimately be discharges to the Shanganagh Wastewater Treatment Plant (WWTP) and treated prior to discharge into Southwestern Irish Sea – Killiney Bay. The Shanganagh WWTP is currently operating under its capacity of 186,000, with a current loading of 127,618 P.E. The Shanganagh WWTP is compliant with the limits set out in its licence and its discharge is not having an observable negative impact on water quality of the Irish Sea, including Killiney Bay (Irish Water, 2020)¹².

5 Overview of the Receiving Environment

5.1 European Sites

The closest European site to the proposed development is Rockabill to Dalkey SAC which is c. 2km north east and Dalkey Islands SPA which is c. 3.8km north east.

- 12 The European sites present in the vicinity of the proposed development are listed in Table 2, along with their qualifying interests and proximity to the proposed development, and shown on 2.

Table 2 European sites in the vicinity of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Special Area of Conservation (SAC)	

¹² Irish Water (2020) Shanganagh D0038-01 Annual Environmental Report 2019.

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>Rockabill to Dalkey Island SAC [003000] 1170 Reefs 1351 Harbour porpoise <i>Phocoena phocaena</i></p> <p>NPWS (2013) <i>Conservation Objectives: Rockabill to Dalkey Island SAC 003000</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	c. 2km north-east of the proposed development
<p>Ballyman Glen SAC [000713] 7220 Petrifying springs with tufa formation (Cratoneurion)* 7230 Alkaline fens</p> <p>NPWS (2019) <i>Conservation Objectives: Ballyman Glen SAC 000713</i>. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 4.4km south-west of the proposed development
<p>Bray Head SAC [000714] 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths</p> <p>NPWS (2017) <i>Conservation Objectives: Bray Head SAC 000714</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	c. 5.3km south-east of the proposed development
<p>Knocksink Wood SAC [000725] 7220 Petrifying springs with tufa formation (Cratoneurion)* 91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles 91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)*</p> <p>NPWS (2020) <i>Conservation objectives for Knocksink Wood SAC [000725]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	c. 5.7km south-west of the proposed development
<p>South Dublin Bay SAC [000210] 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 <i>Salicornia</i> and other annuals colonising mud and sand 2110 Embryonic shifting dunes</p> <p>NPWS (2013) <i>Conservation Objectives: South Dublin Bay SAC 000210</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	c. 6.5km north-west of the proposed development
<p>Wicklow Mountains SAC [002122] 3110 Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> 4030 European dry heaths 4060 Alpine and Boreal heaths 6130 <i>Calaminarian</i> grasslands of the <i>Violetalia calaminariae</i> 6230 Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)</p>	c. 8.3km south-west of the proposed development

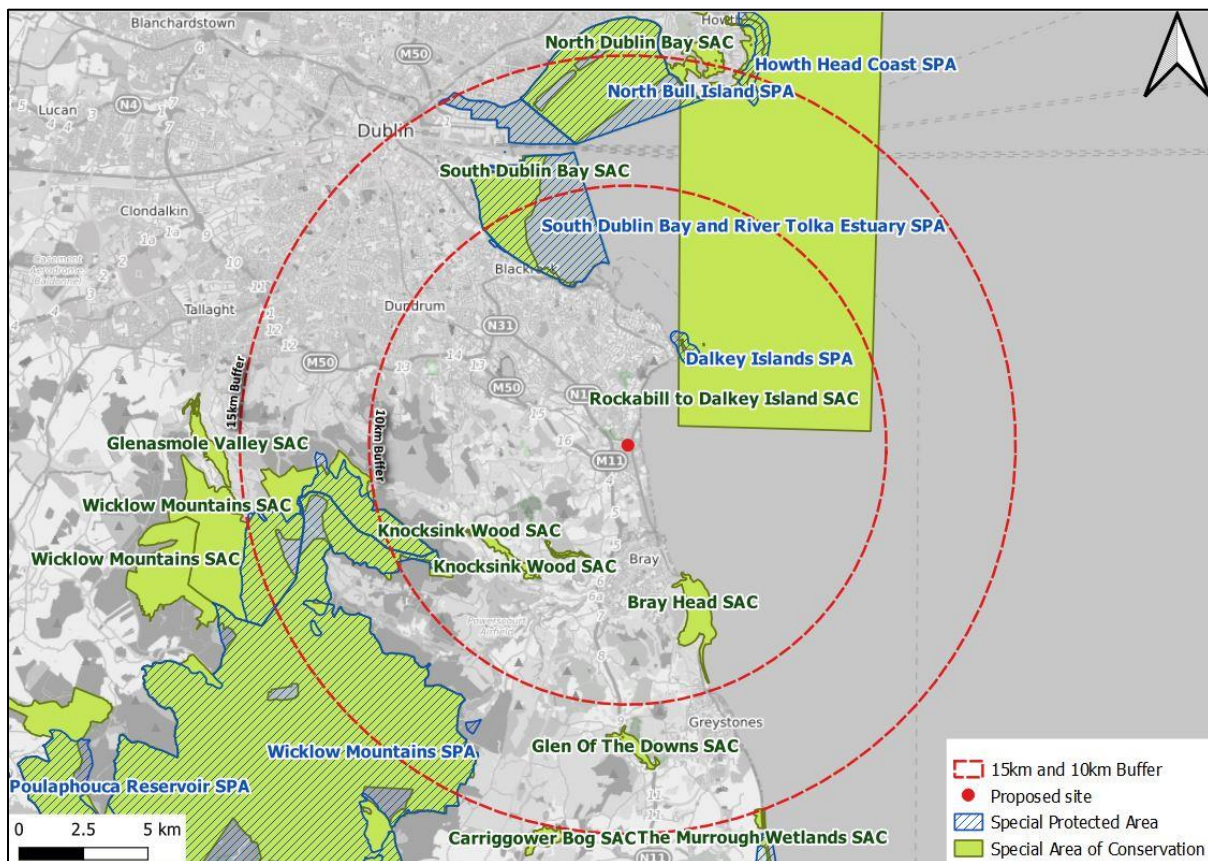
European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>7130 Blanket bogs (* if active bog)</p> <p>8110 Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)</p> <p>8210 Calcareous rocky slopes with chasmophytic vegetation</p> <p>8220 Siliceous rocky slopes with chasmophytic vegetation</p> <p>91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>1355 <i>Lutra lutra</i> (Otter)</p> <p>NPWS (2017) <i>Conservation Objectives: Wicklow Mountains SAC 002122</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	
<p>Glen of the Downs SAC [000719]</p> <p>91A0 Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</p> <p>NPWS (2020) <i>Conservation Objectives for Glen of the Downs SAC [000719]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 10.8km south of the proposed development</p>
<p>North Dublin Bay SAC [000206]</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1210 Annual vegetation of drift lines</p> <p>1310 <i>Salicornia</i> and other annuals colonising mud and sand</p> <p>1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</p> <p>1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>2110 Embryonic shifting dunes</p> <p>2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</p> <p>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)</p> <p>2190 Humid dune slacks</p> <p>1395 Petalwort <i>Petalophyllum ralfsii</i></p> <p>NPWS (2013) <i>Conservation Objectives: North Dublin Bay SAC 000206</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>c. 11.7km north of the proposed development</p>
<p>Howth Head SAC [000202]</p> <p>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts</p> <p>4030 European dry heaths</p> <p>NPWS (2016) <i>Conservation Objectives: Howth Head SAC 000202</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	<p>c. 13.5km north of the proposed development</p>
<p>Carriggower Bog SAC [000716]</p> <p>7140 Transition mires and quaking bogs</p> <p>NPWS (2019) <i>Conservation Objectives: Carriggower Bog SAC 000716</i>. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 14.7km south-west of the proposed development</p>

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>The Murrough Wetlands SAC [002249] 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 7210 Calcareous fens with <i>Cladium mariscus</i> and species of the Caricion <i>davallianae</i> 7230 Alkaline fens NPWS (2020) <i>Conservation objectives for The Murrough Wetlands SAC [002249]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 14.8km south-east of the proposed development</p>
Special Protection Area (SPA)	
<p>Dalkey Islands SPA [004172] A192 Roseate Tern <i>Sterna dougallii</i> A193 Common Tern <i>Sterna hirundo</i> A194 Arctic Tern <i>Sterna paradisaea</i> NPWS (2020) <i>Conservation objectives for Dalkey Islands SPA [004172]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 3.8km north-east of the proposed development</p>
<p>South Dublin Bay and River Tolka Estuary SPA [004024] A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A149 Dunlin <i>Calidris alpina</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A162 Redshank <i>Tringa totanus</i> A179 Black-headed Gull <i>Croicocephalus ridibundus</i> A192 Roseate Tern <i>Sterna dougallii</i> A193 Common Tern <i>Sterna hirundo</i> A194 Arctic Tern <i>Sterna paradisaea</i> A999 Wetland and Waterbirds NPWS (2015) <i>Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>c. 6.4km north-west of the proposed development</p>
<p>Wicklow Mountains SPA [004040] A098 Merlin <i>Falco columbarius</i> A103 Peregrine <i>Falco peregrinus</i></p>	<p>c. 8.3km south-west of the proposed development</p>

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>NPWS (2020) <i>Conservation objectives for Wicklow Mountains SPA [004040]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	
<p>North Bull Island SPA [004006] A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A048 Shelduck <i>Tadorna tadorna</i> A052 Teal <i>Anas crecca</i> A054 Pintail <i>Anas acuta</i> A056 Shoveler <i>Anas clypeata</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A140 Golden Plover <i>Pluvialis apricaria</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A149 Dunlin <i>Calidris alpina</i> A156 Black-tailed Godwit <i>Limosa limosa</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A160 Curlew <i>Numenius arquata</i> A162 Redshank <i>Tringa totanus</i> A169 Turnstone <i>Arenaria interpres</i> A179 Black-headed Gull <i>Croicocephalus ridibundus</i> A999 Wetlands & Waterbirds</p> <p>NPWS (2015) <i>Conservation Objectives: North Bull Island SPA 004006</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>c. 11.7km north of the proposed development</p>
<p>Howth Head Coast SPA [004113] A188 Kittiwake <i>Rissa tridactyla</i></p> <p>NPWS (2020) <i>Conservation objectives for Howth Head Coast SPA [004113]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 13.9km north-east of the proposed development</p>
<p>The Murrough SPA [004186] [A001] Red-throated Diver <i>Gavia stellata</i> [A043] Greylag Goose <i>Anser anser</i> [A046] Light-bellied Brent Goose <i>Branta bernicla hrota</i> [A050] Wigeon <i>Anas penelope</i> [A052] Teal <i>Anas crecca</i> [A179] Black-headed Gull <i>Chroicocephalus ridibundus</i> [A184] Herring Gull <i>Larus argentatus</i> [A195] Little Tern <i>Sterna albifron</i> [A999] Wetland and Waterbirds</p> <p>NPWS (2020) <i>Conservation objectives for The Murrough SPA [004186]</i>. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 15.8km south-east of the proposed development</p>

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>Baldoyle Bay SPA [004016] [A046] Light-bellied Brent Goose <i>Branta bernicla hrota</i> [A048] Shelduck (<i>Tadorna tadorna</i>) [A137] Ringed Plover <i>Charadrius hiaticula</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A157] Bar-tailed Godwit <i>Limosa lapponica</i> [A999] Wetland and Waterbirds</p> <p>NPWS (2013) Conservation Objectives: Baldoyle Bay SPA 004016. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>c. 16.8km north of the proposed development</p>
<p>Ireland's Eye SPA [004117] [A017] Cormorant <i>Phalacrocorax carbo</i> [A184] Herring Gull <i>Larus argentatus</i> [A188] Kittiwake <i>Rissa tridactyla</i> [A199] Guillemot <i>Uria aalge</i> [A200] Razorbill <i>Alca torda</i></p> <p>NPWS (2020) Conservation objectives for Ireland's Eye SPA [004117]. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 17.6km north-east of the proposed development</p>

Figure 1: European sites within the vicinity of the proposed development site



5.1.1 Habitats

- 13 The proposed site comprises of dry meadow grassland with fringing scrub vegetation bounded by sections of treeline to the north, south and north-east and hedgerow to the north, west and south-east. The grassland is currently unmanaged and unused. In previous years it had been grazed by cattle. Other habitats surrounding the proposed site include buildings and artificial surfaces, treelines and amenity grassland to the south.
- 14 There are no Annex I habitats present within the proposed development site or immediate environs.

5.1.2 Flora and Fauna Species

- 15 A National Biodiversity Data Centre (NBDC) database search of a custom polygon approx. 2km around the proposed site returned records of the following Annex II flora species, Annex I bird species, Annex II/Annex IV fauna species:
- Petalwort *Petalophyllum ralfsii*
 - Common tern *Sterna hirundo*
 - Golden plover *Pluvialis apricaria*
 - Kingfisher *Alcedo atthis*
 - Little egret *Egretta garzetta*
 - Little gull *Larus minutus*
 - Mediterranean gull *Larus melanocephalus*
 - Peregrine falcon *Falco peregrinus*
 - Red-throated diver *Gavia stellate*
 - Sandwich tern *Sterna sandvicensis*
 - Bottle-nosed dolphin *Tursiops truncatus*
 - Brown long-eared bat *Plecotus auratus*
 - Common dolphin *Delphinus delphis*
 - Common porpoise *Phocoena phocoena*
 - Grey seal *Halichoerus grypus*
 - Loggerhead turtle *Caretta caretta*
 - Northern bottlenose whale *Hyperoodon ampullatus*
 - Otter *Lutra lutra*
 - Pipistrelle species *Pipistrellus sp.*
 - Soprano pipistrelle *Pipistrellus pygmaeus*
- 16 The lands did not contain any signs of use by any species listed on Annex II of the EU Habitats Directive, and do not contain suitable habitat for any Annex II/Annex IV fauna species.
- 17 The NBDC database search returned records of the following non-native invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) :
- American skunk-cabbage *Lysichiton americanus*
 - Giant hogweed *Heracleum mantegazzianum*
 - Japanese knotweed *Fallopia japonica*

-
- Nuttall's waterweed *Elodea nuttallii*
 - Sea-buckthorn *Hippophae rhamnoides*
 - Spanish bluebell *Hyacinthoides hispanica*
 - Three-cornered leek *Allium triquetrum*

18 Three-cornered leek *Allium triquetrum* and rhododendron *Rhododendron ponticum* which are an invasive flora species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) were identified on the proposed development site during the site visits.

5.1.2.1 Winter Birds

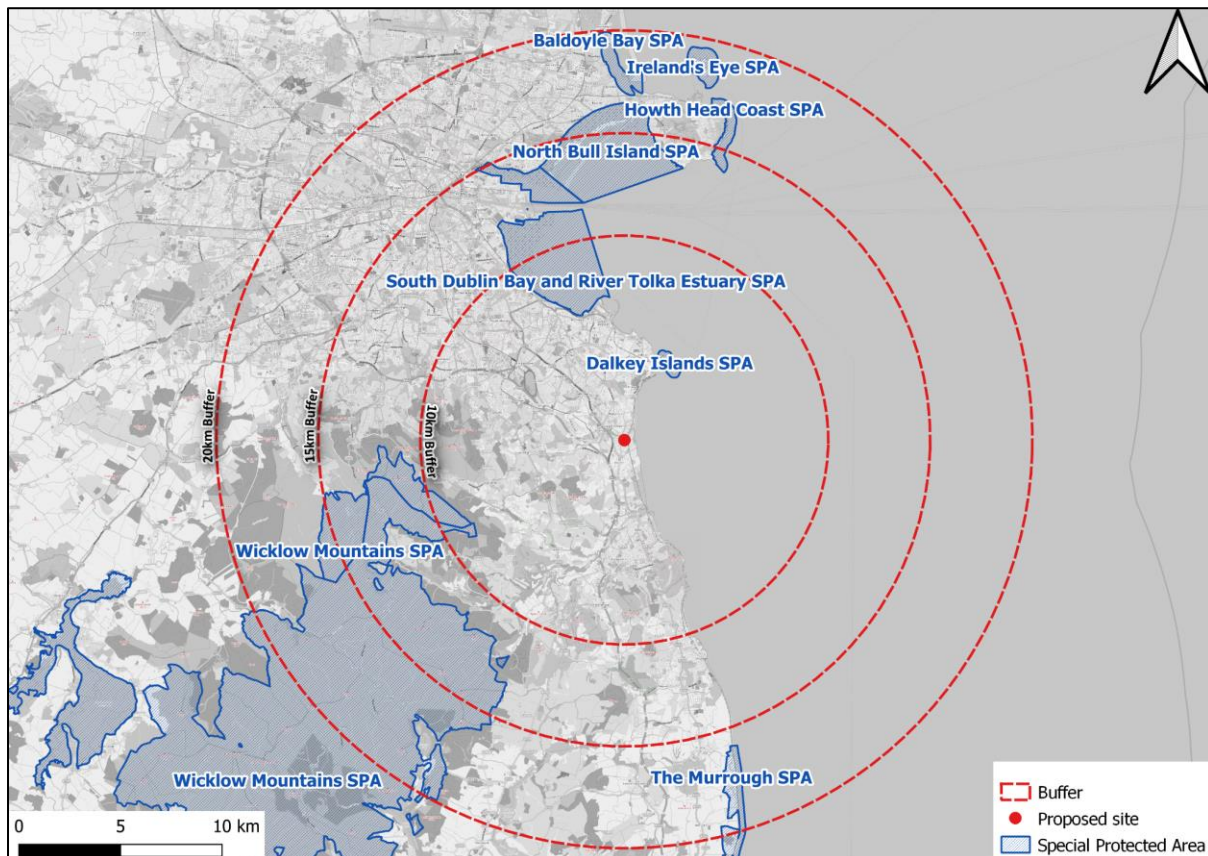
As birds are mobile, and some wintering goose species can travel up to 20km between roosting and feeding sites¹³, it is possible that wintering birds occurring in the vicinity of the proposed development site are associated with SPAs located a significant distance from the proposed development site (see

¹³ Scottish Natural Heritage (2016) Guidance: Assessing connectivity with Special Protection Areas (SPAs). Version 3

-
- 19 Figure 2). light-bellied brent goose and other wintering bird species known to use in-land green-field sites. The existing grassland, proposed for development, represents a suitable in-land feeding site for light-bellied brent goose and other wintering bird species known to use in-land sites.
 - 20 Winter bird surveys carried out from January to March 2020 did not record any brent geese or signs of use of use by geese, such as droppings, at the proposed development site.
 - 21 These surveys recorded one SCI species, Herring Gull *Larus argentatus*, associated with nearby SPAs. The peak count of Herring Gull *Larus argentatus* using the proposed development site was one individual bird feeding on the grassland which is significantly lower than 1% of the international population which is 10,200 birds¹⁴. Results of the winter bird surveys show that the proposed development site is not important in-land or high tide roost sites used by important numbers of wintering SCI birds.

¹⁴ Wetlands International. 2012. Waterbird Population Estimates, Fifth Edition. Summary Report Wetlands International, Wageningen The Netherlands (with estimates available at <http://wpe.wetlands.org/>).

Figure 2: SPAs within 20km of the proposed development site



5.1.3 Hydrology

- 22 There are no surface water features located within the proposed development site.
- 23 The site is located within the Ovoca-Vartry catchment and the Dargle sub-catchment. The site is contained within the Shanganagh River sub-basin, which drains to Killiney Bay.
- 24 The nearest watercourse, according to the EPA envision mapping, is the Shanganagh River, c.140m north of the proposed development site. Regarding water quality, the Shanganagh River was awarded a Q Value of 3-4, or “moderate” quality, by the EPA’s water quality monitoring programme, as measured in 2018 at the monitoring station at Commons Road river monitoring station (RS10S010600), located c.240m north of the proposed development site. The Shanganagh River has a ‘Moderate’ Water Framework Directive (WFD) status and is classified as ‘At risk’. The most recent water quality information for Killiney Bay coastal waterbody indicates that it is ‘Unpolluted’ and has a Water Framework Directive status of ‘ and is regarded to be a waterbody which is ‘Not at risk’.

5.1.4 Hydrogeology

- 25 Geological Survey of Ireland (GSI) data indicates that the site is “locally important aquifer – moderately productive only in local zones”. The Groundwater Body (GWB) underlying the proposed site is the Wicklow GWB which is a ‘poorly productive bedrock’. The site is located in an area of ‘Low’ vulnerability with regards to the ease with which groundwater may be contaminated by human activities.
- 26 Wicklow GWB is currently classified by the EPA as having ‘Good Status’. The WFD risk of the Wicklow GWB is currently under review. The European sites which are designated for groundwater dependent habitats/species, and which occur within the same GWB as the proposed site are Ballyman Glen SAC [000713], Knocksink Wood SAC [000725], Wicklow Mountains SAC [002122], Carriggower Bog SAC [000716] and The Murrrough Wetlands [002249].

5.1.5 Soils & Geology

- 27 Soils on the proposed development site have been classified as non-hazardous¹⁵

6 Potential Impacts, Zone of Influence and Identifying European Sites at Risk of Effects

- 28 Based on the baseline and receiving ecological environment and the nature and characteristics of the proposed development the following potential impacts have been identified:

- Habitat degradation as a result of hydrological impacts
- Habitat degradation as a result of hydrogeological impacts
- Habitat degradation as a result of introducing/spreading non-native invasive species

6.1 Habitat degradation as a result of hydrological impacts

- 29 Surface water run-off during construction and operation will discharge to the local surface water network which will ultimately discharge into Killiney Bay. Therefore, the Zone of Influence (Zoi) of potential effects on water quality from the proposed development during construction and operation could extend to Killiney Bay.
- 30 Contaminated surface water run-off, silt run-off or an accidental pollution event, of a sufficient magnitude, during construction and operation has the potential to affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of European sites in Killiney Bay.
- 31 Breeding SCIs of Dalkey Island SPA utilise the coastal waters of Killiney bay for feeding and roosting. These species would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and roosting. Harbour porpoise would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Reef habitat would be susceptible to sedimentation and changes in water quality also.
- 32 Mitigation measures will be required to ensure that surface water run-off from the proposed development site during construction and operation will not affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of European sites in Killiney Bay; Rockabill to Dalkey Island SAC and Dalkey Island SPA.

6.2 Habitat degradation as a result of hydrogeological impacts

- 33 The proposed development lies within the Wicklow Groundwater Body (Wicklow GWB). European sites within the Wicklow GWB that are designated for groundwater dependant habitats and/or species are Knocksink Wood SAC [000725], Wicklow Mountains SAC [002122], Carriggower Bog SAC [000716] and The Murrough Wetlands [002249]. Based on information published by Geological Survey Ireland (GSI) on the Wicklow GWB¹⁶, 'The majority of groundwater flow in this aquifer will take place in the upper 3m of the rocks. This will be lateral flow towards discharge point such rivers and streams'. In this instance, groundwater flow will be towards the Shanganagh River. As the proposed development lies down gradient of the European sites listed above, it cannot influence groundwater conditions in these European sites.
- 34 Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of Knocksink Wood SAC [000725],

¹⁵ Causeway Geotech (2020) Abingdon Shankill – Ground Investigations Factual Report

¹⁶ https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/WicklowGWB.pdf

Wicklow Mountains SAC [002122], Carriggower Bog SAC [000716] and The Murrough Wetlands [002249], either alone or in combination with any other pans or projects, as a result of hydrogeological effects.

- 35 As described groundwater will be “lateral flow towards discharge points such as rivers and streams” of the Wicklow GWB. There is connectivity between the groundwater on site discharging to the Shanganagh River, c. 135m north of the proposed development site and ultimately to the Southwestern Irish Sea - Killiney Bay, c. 625m upstream. A pollution event, of a sufficient magnitude to effect groundwater quality on site which ultimately flows into Killiney Bay, has the potential to affect the receiving aquatic and marine environments of the Southwestern Irish Sea – Killiney Bay (either alone or in combination with other pressures on water quality), for similar reasons outlined in Section 3.3.2 above. Therefore, there is a possibility of the proposed development undermining the conservation objectives of the qualifying interests or special conservation interests of the European sites within Killiney Bay - Dalkey Islands SPA and Rockabill to Dalkey SAC.
- 36 Mitigation measures will be required to ensure that groundwater from the proposed development site during construction and operation will not affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of European sites in Killiney Bay; Rockabill to Dalkey Island SAC and Dalkey Island SPA.

6.3 Habitat degradation as a result of introducing/spreading non-native invasive species

- 37 As three-cornered leek and rhododendron have been recorded within the proposed development site, there is the potential that the invasive species could be spread or introduced to European sites, and there is a possibility of the spread of invasive species undermining the conservation objectives of the qualifying interests or special conservation interests of the European sites .
- 38 Mitigation measures will be required to ensure that invasive species on the site are treated and managed appropriately so as not to spread or introduce them to Europeans sites and undermine the conservation objectives of European sites.

6.4 Summary

- 39 The potential impacts associated with the proposed development have the potential to affect the receiving environment and, as a result, the conservation objectives supporting the qualifying interest/special conservation interests of two European sites: Dalkey Islands SPA, Rockabill to Dalkey SAC.
- 40 The potential impacts of the proposed development on the receiving environment, their zone of influence, and the European sites at risk of likely significant effects are summarised in Table 3 below.

Table 3 Summary of the potential impacts of the proposed development on the receiving environment, their potential zone of influence, and the European sites within the zone of influence

Potential Direct, Indirect In Combination Effects and the Zol of the Potential Effects	Are there any European sites within the Zol of the proposed development?
Habitat loss Habitat loss will be confined to the lands within the proposed development boundary.	No There are no European sites within the proposed development boundary
Habitat degradation as a result of hydrological impacts Habitats and species downstream of the proposed development site and the associated surface water drainage discharge points, and downstream of offsite wastewater treatment plants.	Yes The following European sites are at risk of hydrological effects arising from surface water run-off and pollution: <ul style="list-style-type: none"> • Dalkey Islands SPA • Rockabill to Dalkey SAC
Habitat degradation as a result of hydrogeological impacts	Yes

Potential Direct, Indirect In Combination Effects and the Zol of the Potential Effects	Are there any European sites within the Zol of the proposed development?
Groundwater-dependant habitats, and the species those habitats support, in the local area that lie downgradient of the proposed development site.	The following European sites at risk of hydrogeological effects associated with the proposed development <ul style="list-style-type: none"> • Dalkey Islands SPA • Rockabill to Dalkey SAC
<p>Habitat degradation as a result of introducing/spreading non-native invasive species</p> <p>Habitat areas within, adjacent to, and potentially downstream of the proposed development site.</p>	<p>Yes</p> <p>There are non-native invasive species present on the proposed development site, therefore there is a risk associated with the proposed development to European sites from the spread/ introduction of non-native invasive species.</p>
<p>Disturbance and displacement impacts</p> <p>Potentially up to several hundred metres from the proposed development boundary, dependent upon the predicted levels of noise, vibration and visual disturbance associated with the proposed development, taking into account the sensitivity of the qualifying interest species to disturbance effects</p>	<p>No</p> <p>There are no European sites within the potential zone of influence of disturbance effects associated with the construction or operation of the proposed development</p>

7 Assessment of Effects on European Sites

- 41 This section of the NIS assesses the direct and indirect impacts of the proposed development on the European sites which fall within its zone of influence. For each of these European sites, the assessment below sets out the relevant ecological baseline information, the analysis of the potential impacts, the qualifying interests/special conservation interests at risk of these potential impacts, in view of the sites' conservation objectives, and the mitigation measures (if required) to avoid/reduce the effects of any potential impacts.
- 42 The assessment of the proposed development in combination with any other plans or projects on European sites is presented in Section 8.

7.1 Dalkey Islands SPA

7.1.1 Ecological Baseline Description for Dalkey Islands SPA

The Natura 2000 Standard Data Form¹⁷ lists the site as an important site for both breeding and staging terns. There is a well-established colony of common terns *Sterna hirundo* and smaller numbers of Arctic tern *Sterna paradisaea* and roseate terns *Sterna dougallii*. The site along with other parts of south Dublin Bay is used by the three tern species as a major post-breeding/pre-migration autumn roost area. The site also has breeding great black-backed gull *Larus marinus*, shelduck and oystercatcher *Haematopus ostralegus*. The site is known to be frequented in winter by significant numbers of turnstone *Arenaria interpres*, purple sandpiper *Calidris maritima* and light-bellied brent goose *Branta bernicla hrota*. Threats to the site include urbanisation and human habitation, human intrusions and disturbances, and agriculture.

¹⁷ NPWS (2018) *Natura 2000 - Standard Data Form for Dalkey Islands SPA 004172*. Department of Culture, Heritage and the Gaeltacht.

7.1.2 Qualifying Interests and Conservation Objectives of Dalkey Islands SPA

- 43 The qualifying interests of Dalkey Islands SPA , and the overall conservation objective, are listed below in Table 4.

Table 4 Qualifying Interests and Conservation Objectives of Dalkey Islands SPA

Qualifying Interest(s)	Conservation Objective(s)
[A192] Roseate tern <i>Sterna dougallii</i> [A193] Common tern <i>Sterna hirundo</i> [A194] Arctic tern <i>Sterna paradisaea</i> NPWS (2020) <i>Conservation Objectives for Dalkey Islands SPA 004172</i> . Version 6.0. Department of Culture, Heritage and the Gaeltacht.	To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA

- 44 In the absence of a site-specific conservation objectives document for the Dalkey Islands SPA, to inform this assessment a set of site-specific conservation objectives has been compiled for the qualifying interests of the SPA, based on site-specific conservation objectives documents available for other European sites with equivalent qualifying interests.
- 45 This document sets out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests within the European site. Affecting the conservation condition of the qualifying interests/special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of Dalkey Islands SPA are presented in Section 7.1.3, **Error! Reference source not found.5.**

7.1.3 Examination and Analysis of Potential Direct and Indirect Impacts

- 46 The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of Dalkey Islands SPA, are:
- The effects of hydrological impacts on QIs and SCIs
 - The effects of hydrogeological impacts on QIs and SCIs
 - The effects of introducing/spreading non-native invasive

7.1.3.1 Habitat degradation as a result of hydrological impacts

- 47 Contaminated surface water run-off, silt run-off or an accidental pollution event, of a sufficient magnitude during the construction operational phase of the proposed development has the potential to affect water quality in immediate vicinity of the proposed development site and the Southwestern Irish Sea – Killiney Bay as the proposed development site ultimately drains to the coastal waterbody.
- 48 Internationally important numbers of breeding and pre-migrating/post-breeding Roseate, Common and Arctic Terns use intertidal and marine habitats in Killiney for feeding and roosting. These species would be vulnerable to changes in water quality as a result of contaminated surface water run-off, silt or an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding.
- 49 Affecting the water quality of the immediate vicinity of the proposed development site and Southwestern Irish Sea – Killiney Bay due to contaminated surface water run-off, silt or an accidental pollution incident has the potential to undermine the conservation objectives of Dalkey Islands SPA by affecting the quality of intertidal and marine habitats in the immediate vicinity of the proposed development site and Killiney Bay and/or through direct contact with SCI species causing harm or mortality

7.1.3.2 Habitat degradation as a result of hydrogeological impacts

- 50 An accidental pollution event during construction and operation has the potential to affect water quality in immediate vicinity of the proposed development site and the Southwestern Irish Sea – Killiney Bay as the groundwater under the proposed development site ultimately drains to the coastal waterbody.
- 51 Internationally important numbers of breeding and pre-migrating/post-breeding Roseate, Common and Arctic Terns use intertidal and marine habitats in Killiney Bay for feeding and roosting. These species would be vulnerable to an accidental pollution incident either directly *e.g.* through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding.
- 52 Affecting the water quality of the immediate vicinity of the proposed development site and Southwestern Irish Sea – Killiney Bay due to an accidental ground water pollution event has the potential to undermine the conservation objectives of Dalkey Islands SPA by affecting the quality of intertidal and marine habitats in the immediate vicinity of the proposed development site and Killiney Bay and/or through direct contact with SCI species causing harm or mortality

7.1.3.3 Habitat degradation as a result of introducing/spreading non-native invasive species

- 53 The introduction/spreading of non-native invasive species, via hydrological connections, has the potential to affect the suitability of Dalkey Islands SPA for breeding tern populations.
- 54 The Dalkey Islands SPA is of importance for both breeding and roseate, common and Arctic terns. These species would be vulnerable to the introduction/spreading of non-native invasive species by affecting the suitable habitats within the Dalkey Islands SPA on which they rely on for breeding.
- 55 Affecting the suitability of breeding grounds on the Dalkey Islands SPA has the potential to undermine the conservation objectives of Dalkey Islands SPA by not maintaining sufficiently large habitat to maintain its populations on a long-term basis

7.1.3.4 Summary

- 56 Table 5 below presents a summary of the potential impacts of the proposed development on the qualifying interests of Dalkey Islands SPA, and how these impacts relate to affecting the site's conservation objectives.

Table 5 Potential Impacts/Effects on the Conservation Objectives of Dalkey Islands SPA

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Roseate Tern (<i>Sterna dougallii</i>) [A192]			
To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Passage population: individuals / Number / No significant decline	Yes - Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding and roosting resources of SCI species, or result in mortality of SCI species. -Spread of invasive species to the Dalkey Islands could affect suitable roosting and nesting habitat of SCI species.	Yes The mitigation measures described in Section 7.1.4, to protect water quality and to avoid the spread of invasive species are required..	No
Distribution: roosting areas / Number; location; area (hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase			
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of roseate tern among the post-breeding aggregation of terns			
Common Tern (<i>Sterna hirundo</i>) [A193]			
To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Breeding population abundance: apparently occupied nests (AONs) / Number / No significant decline	Yes - Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding and roosting resources of SCI species, or result in mortality of SCI species. -Spread of invasive species to the Dalkey Islands could affect suitable roosting and nesting habitat of SCI species.	Yes The mitigation measures described in Section 7.1.4, to protect water quality and to avoid the spread of invasive species are required.	No
Productivity rate: fledged young per breeding pair / Mean number / No significant decline			
Passage population: individuals / Number / No significant decline			
Distribution: breeding colonies / Number; location; area (Hectares) / No significant decline			
Distribution: roosting areas / Number; location; area (Hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase			
Disturbance at breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding common tern population			
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of common tern among the post-breeding aggregation of terns			
Arctic Tern (<i>Sterna paradisaea</i>) [A194]			
To maintain the favourable conservation condition of the special conservation interests of the SPA, which is defined as follows:			
Passage population / Number of individuals / No significant decline	Yes - Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding and roosting resources of SCI species, or result in mortality of SCI species. - Spread of invasive species to the Dalkey Islands could affect suitable roosting and nesting habitat of SCI species.	Yes The mitigation measures described in Section 7.1.4, to protect water quality and to avoid the spread of invasive species are required.	No
Distribution: roosting areas / Number; location; area (hectares) / No significant decline			
Prey biomass available / Kilogrammes / No significant decline			
Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase			
Disturbance at roosting site / Level of impact / Human activities should occur at levels that do not adversely affect the numbers of Arctic tern among the post-breeding aggregation of terns			

7.1.4 Mitigation Measures

- 57 This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on Dalkey Islands SPA. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment.
- 58 The below mitigation measures are also included in the site-specific Construction Environmental Management Plan (CEMP) and Method Statement which will be used by the appointed contractor to undertake the works.

7.1.4.1 Measures to Protect Surface Waters during Construction and Operation

Construction

- 59 A project-specific Construction Environmental Management Plan (CEMP) will be prepared prior to the construction of the proposed development. It will cover all potentially polluting activities and include mitigation measures for critical elements such as storage and handling of harmful materials. These mitigation measures will be incorporated into the CEMP and implemented on site by the contractor which it is recommended is made a condition of planning permission if granted and will ensure that potential risks to surface water/groundwater are appropriately addressed. All personnel working on the site will be trained in the implementation of these measures, where relevant.
- 60 The development of these mitigation measures has been completed, as will the project specific CEMP, in consideration of following standard best international practice including but not limited to:
- Construction Industry Research and Information Association (CIRIA) (2005) *Environmental Good Practice on Site (C692)*
 - Construction Industry Research and Information Association (2001) *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*
 - Construction Industry Research and Information Association (2000) *Environmental Handbook for Building and Civil Engineering Projects (C512)*
 - CIRIA, (2007) *The SUDS Manual (C697)*
 - CIRIA *C648: Control of water pollution from linear construction projects: Technical guidance*
 - CIRIA (2006) *Control of water pollution from linear construction projects: Site guide (C648)*
 - UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.
 - BPGCS005, Oil Storage Guidelines,
 - Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.*
- 61 Design measures to maintain water quality in the receiving watercourse, the Shanganagh River, c. 138m north of the proposed development site, during operation include those listed below.
- 62 The construction contractor will be required to implement the following specific mitigation measures for release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control:
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.
 - Pouring of cementitious materials, if required for the works, adjacent to surface water drainage features, or drainage features connected to same, will only be carried out in the dry. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete

will not be discharged to existing surface water drainage systems. Concrete washout areas will be located remote from any surface water drainage features to avoid accidental discharge to watercourses.

- Any fuels or chemicals on site will be stored within double sealed tanks with bunds to prevent any seepage of same into groundwater.
- Dedicated fuel filling points will be set-up with all plant to be brought to these points for filling. All fuels and chemicals required to be stored on-site will be clearly marked.
- All mobile fuel bowsers shall carry a spill kit and all relevant personnel must be familiar with the use of this equipment. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention should be taken during refuelling and maintenance operations. Particular attention should be paid to gradient and ground conditions, which could increase risk of discharge to waters.
- A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
 - Valid Safety Data Sheets;
 - Health & Safety, Environmental controls to be implemented when storing, handling, using and in the event of spillage of materials;
 - Emergency response procedures/precautions for each material; and,
 - The Personal Protective Equipment (PPE) required when using the material.
- Implementation of response measures to potential pollution incidents.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plan will be prepared prior to works commencing and they will be communicated, resourced and implemented for the duration of the works. Emergency procedures/precautions and spillage kits will be available and construction staff will be trained and experienced in emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site. Wheel wash facilities will be provided at all site egress points, if required. Dedicated road sweeper facilities will be provided as required.
- If, in the very unlikely event, groundwater is encountered during construction works and temporary pumping at a localised location is required:
 - An appropriate dewatering system and groundwater management system specific to the site conditions will be designed and maintained. These will include measures to minimise any surface water inflow into the excavation, where possible, and the prolonged exposure of groundwater to the atmosphere will be avoided.
 - Any groundwater encountered will be gathered locally to facilitate pumping with subsequent discharge, under licence, to the local sewerage drainage network. The pumped water will be discharged under licence to the local sewerage drainage network. Prior to any discharge, the water will be passed through silt traps and hydrocarbon/oil interceptors within the construction site confines. This will result in the separation of sediment from the water prior to its discharge and will ensure that the water is of adequate quality before it enters the local authority drainage system. The use of silt traps and interceptors will be supplemented by proper housekeeping and control measures such as regular testing and monitoring of water quality to ensure compliance.

- Qualitative and quantitative monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the river. The use of silt traps will be adopted if the monitoring indicates the requirement for same with no silt or contaminated water permitted to discharge to the receiving water environment
- The removal of any contaminated land from the proposed development site, if required, and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- A watching brief and discovery procedure for contaminated material if required will be prepared and adopted by the appointed contractor prior to excavation works commencing on site. These documents will detail how potentially contaminated material will be dealt with during the excavation phase.
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required/applicable and to address any potential issues that may arise.

Operation

63 Sustainable Urban Drainage Systems (SuDS) are to be implemented to remove any potential for contaminated/polluted surface water to drain via the new surface water sewer network proposed as part of the development . SuDS proposed for the site include:

- Two attenuation tanks - to attenuate flows up to a 1 in 100-year storm event with a 10% allowance for climate change, located in the south-east corner of the site under the access road;
- Green roofs - the total proportion of green roofs provided will be a minimum of 60% of the total roof area of the proposed development in accordance with the County Development Plan;
- Green podium – two podium areas are proposed to have an intensive green podium area;
- Permeable pavements - the car parking bays on site are proposed as permeable pavements. The use of permeable pavers for car parking areas not under the podium is proposed in lieu of an oil separator;
- Tree pits – interception design of tree root system (bio retention areas), pavements drained by tree root systems can be considered to provide Interception;
- Rain gardens - a large proportion of pavement surfaces are to runoff overland to rain gardens. These tree rain garden systems provide interception and treatment prior to entering the drainage network;
- A petrol inceptor - located upstream of the proposed attenuation tanks; and,
- Soft landscape - to reduce the run-off generated from the site.

7.1.4.2 Mitigation measures to Protect Ground Water Quality during Construction and Operation

Construction

64 A project-specific Construction Environmental Management Plan (CEMP) will be prepared prior to the construction of the proposed development. It will cover all potentially polluting activities and include mitigation measures for critical elements such as storage and handling of harmful materials. These mitigation measures will be incorporated into the CEMP and implemented on site by the contractor which it is recommended is made a condition of planning permission if granted and will ensure that potential risks to surface water/groundwater are appropriately addressed. All personnel working on the site will be trained in the implementation of these measures, where relevant.

- 65 The development of these mitigation measures has been completed, as will the project specific CEMP, in consideration of following standard best international practice including but not limited to:
- Construction Industry Research and Information Association (CIRIA) (2005) *Environmental Good Practice on Site (C692)*
 - Construction Industry Research and Information Association (2001) *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*
 - Construction Industry Research and Information Association (2000) *Environmental Handbook for Building and Civil Engineering Projects (C512)*
 - CIRIA, (2007) *The SUDS Manual (C697)*
 - CIRIA *C648: Control of water pollution from linear construction projects: Technical guidance*
 - CIRIA (2006) *Control of water pollution from linear construction projects: Site guide (C648)*
 - UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.
 - BPGCS005, Oil Storage Guidelines,
 - Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.*
- 66 Design measures to maintain water quality in the receiving watercourse, the Shanganagh River, c. 138m north of the proposed development site, during operation include those listed below.
- 67 The construction contractor will be required to implement the following specific mitigation measures for release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control:
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.
 - Pouring of cementitious materials, if required for the works, adjacent to surface water drainage features, or drainage features connected to same, will only be carried out in the dry. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Concrete washout areas will be located remote from any surface water drainage features to avoid accidental discharge to watercourses.
 - Any fuels or chemicals on site will be stored within double sealed tanks with bunds to prevent any seepage of same into groundwater.
 - Dedicated fuel filling points will be set-up with all plant to be brought to these points for filling. All fuels and chemicals required to be stored on-site will be clearly marked.
 - All mobile fuel bowsers shall carry a spill kit and all relevant personnel must be familiar with the use of this equipment. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention should be taken during refuelling and maintenance operations. Particular attention should be paid to gradient and ground conditions, which could increase risk of discharge to waters.
 - A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
 - Valid Safety Data Sheets;
 - Health & Safety, Environmental controls to be implemented when storing, handling, using and in the event of spillage of materials;
 - Emergency response procedures/precautions for each material; and,

- The Personal Protective Equipment (PPE) required when using the material.
- Implementation of response measures to potential pollution incidents.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plan will be prepared prior to works commencing and they will be communicated, resourced and implemented for the duration of the works. Emergency procedures/precautions and spillage kits will be available and construction staff will be trained and experienced in emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site. Wheel wash facilities will be provided at all site egress points, if required. Dedicated road sweeper facilities will be provided as required.
- If, in the very unlikely event, groundwater is encountered during construction works and temporary pumping at a localised location is required:
 - An appropriate dewatering system and groundwater management system specific to the site conditions will be designed and maintained. These will include measures to minimise any surface water inflow into the excavation, where possible, and the prolonged exposure of groundwater to the atmosphere will be avoided.
 - Any groundwater encountered will be gathered locally to facilitate pumping with subsequent discharge, under licence, to the local sewerage drainage network. The pumped water will be discharged under licence to the local sewerage drainage network. Prior to any discharge, the water will be passed through silt traps and hydrocarbon/oil interceptors within the construction site confines. This will result in the separation of sediment from the water prior to its discharge and will ensure that the water is of adequate quality before it enters the local authority drainage system. The use of silt traps and interceptors will be supplemented by proper housekeeping and control measures such as regular testing and monitoring of water quality to ensure compliance.
 - Qualitative and quantitative monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the river. The use of silt traps will be adopted if the monitoring indicates the requirement for same with no silt or contaminated water permitted to discharge to the receiving water environment
- The removal of any contaminated land from the proposed development site, if required, and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- A watching brief and discovery procedure for contaminated material if required will be prepared and adopted by the appointed contractor prior to excavation works commencing on site. These documents will detail how potentially contaminated material will be dealt with during the excavation phase.
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required/applicable and to address any potential issues that may arise.

Operation

- 68 Sustainable Urban Drainage Systems (SuDS) are to be implemented to remove any potential for contaminated/polluted surface water to drain via the new surface water sewer network proposed as part of the development . SuDS proposed for the site include:

- Two attenuation tanks - to attenuate flows up to a 1 in 100-year storm event with a 10% allowance for climate change, located in the south-east corner of the site under the access road;
- Green roofs - the total proportion of green roofs provided will be a minimum of 60% of the total roof area of the proposed development in accordance with the County Development Plan;
- Green podium – two podium areas are proposed to have an intensive green podium area;
- Permeable pavements - the car parking bays on site are proposed as permeable pavements. The use of permeable pavers for car parking areas not under the podium is proposed in lieu of an oil separator;
- Tree pits – interception design of tree root system (bio retention areas), pavements drained by tree root systems can be considered to provide Interception;
- Rain gardens - a large proportion of pavement surfaces are to runoff overland to rain gardens. These tree rain garden systems provide interception and treatment prior to entering the drainage network;
- A petrol inceptor - located upstream of the proposed attenuation tanks; and,
- Soft landscape - to reduce the run-off generated from the site.

7.1.4.3 Measures to Prevent the Introduction/Spread of Invasive Species during Construction

69 A detailed invasive species management plan will be prepared by a suitably qualified invasive species specialist prior to commencement of any construction works (including enabling works). The management plan will include the following measures which are required to control invasive plant species listed on the Third Schedule of the EC (Birds and Natural Habitats) Regulations S.I. 477 of 2011 as amended on site and prevent the spread of such species to the wider environment during construction or operation of the proposed development:

- The proposed development site will be re-surveyed for Third Schedule invasive plant species (including three-cornered leek and rhododendron) prior to any construction works (including enabling works). This will be undertaken in late spring, when the plants are in their vegetative phase and clearly identifiable above ground;
- Areas identified will be demarcated by fencing and signage by the site ecologist prior to the commencement of a construction works within the lands;
- Detailed eradication methods for three-cornered leek and rhododendron are included in below sections. Contaminated material will be removed from site by an appropriately qualified and licenced professional with experience in treatment of invasive species. The movement of plant material of any plants listed on the Third Schedule requires a licence from the National Parks and Wildlife Service (NPWS) under Section 49 of the *European Communities (Birds and Natural Habitats) Regulations, 2011* (as amended). Invasive species (particularly roots, flower heads or seeds) must be disposed of at licensed waste facilities or composting sites, appropriately buried, or incinerated having regard to relevant legislation. All disposals must be carried out in accordance with the relevant Waste Management legislation;
- Species listed on the Third Schedule of the EC (Birds and Natural Habitats) Regulations 2011¹⁸ are considered to be high-risk invasive plant species. The requirement for further treatment of both species will be determined based on ongoing monitoring of the lands following completion of initial clearance.

Biosecurity Measures

¹⁸ *European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015*; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).

The appointed contractor will implement appropriate biosecurity measures on site, as deemed relevant and advised by the specialist invasive species contractor during and after the management of invasive species located within the site. These will include but not be limited to the following biosecurity measures:

- All invasive species will be clearly demarcated by fencing with appropriate signage, prior to and during construction, to avoid any disturbance and to exclude access by plant and machinery;
- No machinery used will be used for other works until they are fully cleaned down at a designated wash area and then visually inspected by a specialist to ensure no invasive species are present;
- The footwear of any site personnel working within the contaminated areas, as part of the management works, will also be washed down at the designated wash area and then visually inspected to ensure no invasive species are present; and,
- The material left after machinery has been pressure washed must be contained, collected and disposed of along with the other invasive species material.

Three-cornered leek

- 70 The population of Three-cornered leek will be mapped prior to construction commencing on site. The map of the species' extent will be shared with the planning authority and with the construction contractor, to inform a final construction and environment management plan for the proposed scheme. Construction personnel will be trained on identification of invasive species, and best practice methods to avoid spreading invasive species. This will include avoiding earthworks in the area of infestation, and the operation of a wheel wash and designated equipment wash-down area for vehicle and personnel entering and exiting site.
- 71 As earthworks are required, it will not be feasible to fence off infestations of Three-cornered leek from construction work. In this instance, the infested areas will be treated through careful removal and disposal of soil and bulbs and/or spraying with an herbicide (by an appropriately licenced and qualified contractor) during the growth season.
- 72 Repeated eradication efforts may be required.

Rhododendron

- 73 Rhododendron regrows vigorously when cut. As a result, some method of stump killing or removal is always necessary. Any untreated cut stump will regrow and in most cases flower within 3-4 years. Treatment programmes can be divided into 3 main stages: initial removal, control of stems and roots, and follow up. Measures are taken from Invasive Species Ireland Best Practice Management Guidelines¹⁹ guidance document.
- 74 Cut and remove stems by hand or chainsaw, cutting as close to the ground as possible to remove above ground growth. Chip or remove the cut material from the area to allow for effective follow-up work and prevent regrowth. Chipped material can provide good weed barrier around ornamental garden areas. Flailing has also been effectively used in Ireland to treat young or immature growth. Although not suitable on all sites and locations, especially steeply sloping or wet sites, it is very effective as it breaks up woody stems upon contact.
- 75 The removal of above ground growth will not prevent regrowth as Rhododendron will regrow from cut stems and stumps. There are four recommended methods to achieve successful management after the initial cut and removal:

¹⁹ Maguire, C.M., Kelly, J. and Cosgrove, P.J. (2008). Best Practice Management Guidelines Rhododendron Rhododendron ponticum and Cherry Laurel Prunus laurocerasus. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

- Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be done manually or with a tractor and plough. To avoid regrowth, stumps should be turned upside down and soil should be brushed off roots.
- Direct stump treatment by painting or spot spraying freshly cut low stumps with a herbicide immediately after been cut. Glyphosate (20% solution), triclopyr (8% solution) or ammonium sulphate (40% solution) are known to be effective during suitable weather conditions i.e. dry weather. The herbicide concentrations used, and timings of applications vary according to which chemical is used. Use of a vegetable dye is recommended to mark treated stumps and all stumps should be targeted. A handheld applicator will help avoid spray drift onto surrounding non-target species. Always read the label and follow the manufacturers guidelines when using herbicides. Remember that using
- A variation on the stump treatment method is stem injection, using a 'drill and drop' methodology, whereby, if the main stem is cut and is large enough for a hole to be drilled into it, the hole can be used to facilitate the targeted application of glyphosate (25% solution). The main drawback is that the dead Rhododendron may persist in situ for 10-15 years.
- Stump regrowth and seedlings can be effectively killed by spraying regrowth with a suitable herbicide, usually glyphosate. Best practice spraying protocols should be carefully followed. General broadcast spraying is not as effective as stump spot treatment and has the potential to impact on surrounding non-target species. Rhododendron leaves are thick and waxy. For herbicide treatment to be effective each individual leaf needs to be thoroughly wetted with herbicide to kill the plant.

7.1.5 Residual Impacts

- 76 Following the implementation of mitigation measures outlined in Section 7.1.4, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the special conservation interests Dalkey Islands SPA and there are therefore no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of the Dalkey Islands SPA.

7.1.6 Conclusion of Assessment for the Dalkey Islands SPA

- 77 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the special conservation interests of Dalkey Islands SPA, the potential impacts, and whether or not the predicted effects would affect the conservation objectives that support the conservation condition of the special conservation interests, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of Dalkey Islands SPA.

7.2 Rockabill to Dalkey Island SAC

7.2.1 Ecological Baseline Description for the Rockabill to Dalkey Island SAC

- 78 This SAC is a marine site which is a rectangle shaped area extending from Rockabill south to Dalkey Island in south Dublin. The SAC has been selected for the Annex I Habitats Directive habitat: [1170] Reefs.
- 79 The only species listed as a qualifying interest for the Rockabill to Dalkey Island SAC is the Harbour porpoise *Phocoena phocoena* [1351]. Surveys of the site estimated that there are 211±47 Harbour porpoises in the northern part of the site and 138±33 in the southern part (Berrow *et al.*, 2010). Calves and juveniles have been recorded across the SAC, which suggests the site has value in the reproductive cycle of the species.

7.2.2 Qualifying Interests and Conservation Objectives of the Rockabill to Dalkey Island SAC

- 80 The qualifying interests of the Rockabill to Dalkey Island SAC, and the overall conservation objective, are listed below in Table 6.

Table 6: Qualifying Interests and Conservation Objectives of the Rockabill to Dalkey Island SAC

Qualifying Interest(s)	Conservation Objective(s)
[1170] Reefs [1351] Harbour porpoise <i>Phocoena phocoena</i> NPWS (2013) <i>Conservation Objectives: Rockabill to Dalkey Island SAC 003000</i> . Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	To maintain the favourable conservation condition of the Annex I habitat and the Annex II species for which the SAC has been selected.

- 81 In conjunction with considering the generic conservation objective for SACs “To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected”, the available site specific conservation objectives document for Rockabill to Dalkey Island SAC also informed this assessment.
- 82 This document sets out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests within the European site. Affecting the conservation condition of the qualifying interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of Rockabill to Dalkey Island SAC are presented in Table 7.

7.2.3 Examination and Analysis of Potential Direct and Indirect Impacts

- 83 The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective, attributes and targets supporting the conservation condition of the qualifying interests of Rockabill to Dalkey Island SAC are:
- The effects of hydrological impacts on QIs and SCIs
 - The effects of hydrogeological impacts on QIs and SCIs

7.2.3.1 Habitat degradation as a result of hydrological impacts

- 84 Contaminated surface water run-off, silt run-off or an accidental pollution event, of a sufficient magnitude during the construction and operational phase of the proposed development has the potential to affect water quality in the Southwestern Irish Sea - Killiney Bay as the proposed development site ultimately drains to the coastal waterbody via the proposed new surface water sewer network. Affecting the water quality of in the Southwestern Irish Sea - Killiney Bay due to changes in water quality as a result of contaminated surface water run-off, silt or an accidental pollution incident has the potential to undermine the conservation objectives of Rockabill to Dalkey Island SAC by affecting the quality of Annex I habitat [1170] Reefs, and the habitat of Harbour porpoise [1351] for which the site is designated. Harbour porpoise

would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Reef habitat would be susceptible to sedimentation and changes in water quality also.

7.2.3.2 Habitat degradation as a result of hydrogeological impacts

- 85 An accidental pollution event of sufficient magnitude has the potential to affect groundwater quality locally within the Wicklow GWB, which flows towards the Shanganagh River and ultimately discharges into the Southwestern Irish Sea - Killiney Bay. Affecting the water quality of in the Southwestern Irish Sea - Killiney Bay due to an accidental groundwater pollution event during construction or operation has the potential to undermine the conservation objectives of Rockabill to Dalkey Island SAC by affecting the quality of Annex I habitat [1170] Reefs and the habitat of Harbour porpoise [1351] for which the site is designated. Harbour porpoise would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely. Reef habitat would be susceptible to sedimentation and changes in water quality also.

Table 7: Potential Impacts on the Conservation Objectives of the Rockabill to Dalkey Island SAC

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Reefs [1170] Maintain the favourable conservation condition			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect the quality of the reef habitat for which this site is designated.	Yes The mitigation measures described in Section 7.1.4.1 and Section 7.1.4.2, to protect water quality are required	No
Habitat distribution / Occurrence / Distribution is stable or increasing, subject to natural processes.			
Community structure / Biological composition / Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.			
Harbour porpoise [1351] Maintain the favourable conservation condition			
Access to suitable habitat / Number of artificial barriers / Species range within the site should not be restricted by artificial barriers to site use	Yes Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of QI species, or result in mortality of QI species.	Yes The mitigation measures described in Section 7.1.4.1 and Section 7.1.4.2, to protect water quality are required	No
Disturbance / Level of impact / Human activities should occur at levels that do not adversely affect the Harbour porpoise community at the site			

7.2.3.3 The effects of hydrogeological impacts on QI species

- 86 An accidental pollution event has the potential to affect groundwater quality within the Wicklow GWB, which ultimately discharges into the Southwestern Irish Sea - Killiney Bay. Affecting the water quality of in the Southwestern Irish Sea - Killiney Bay due to an accidental groundwater pollution event during construction or operation.
- 87 Harbour porpoise use marine habitats in the Southwestern Irish Sea - Killiney Bay. Harbour porpoise would be vulnerable to an accidental pollution incident either directly e.g. through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding.
- 88 Affecting the groundwater quality of the immediate vicinity of the proposed development site and the Southwestern Irish Sea - Killiney Bay due to an accidental pollution event has the potential to undermine the conservation objectives of Rockabill to Dalkey Island SAC by affecting the quality of intertidal and marine habitats in the immediate vicinity of the proposed development site and Killiney Bay and/or through direct contact with QI species causing harm or mortality.

Table 7: Potential Impacts on the Conservation Objectives of the Rockabill to Dalkey Island SAC

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Reefs [1170] Maintain the favourable conservation condition			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect the quality of the reef habitat for which this site is designated.	Yes The mitigation measures described in Section 7.1.4.1 and Section 7.1.4.2, to protect water quality are required	No
Habitat distribution / Occurrence / Distribution is stable or increasing, subject to natural processes.			
Community structure / Biological composition / Conserve the following community types in a natural condition: Intertidal reef community complex; and Subtidal reef community complex.			
Harbour porpoise [1351] Maintain the favourable conservation condition			
Access to suitable habitat / Number of artificial barriers / Species range within the site should not be restricted by artificial barriers to site use	Yes Contaminated surface water run-off, silt or an accidental pollution incident of a sufficient magnitude, either alone or cumulatively with other pollution sources, could affect feeding resources of QI species, or result in mortality of QI species.	Yes The mitigation measures described in Section 7.1.4.1 and Section 7.1.4.2, to protect water quality are required	No
Disturbance / Level of impact / Human activities should occur at levels that do not adversely affect the Harbour porpoise community at the site			

7.2.4 Mitigation Measures

- 89 This section presents the mitigation measures that will be implemented during construction and operation to avoid or reduce the potential impacts of the proposed development on Rockabill to Dalkey Island SAC. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment, and are included in the site-specific CEMP and Method Statement.
- 90 See the sections listed below which provide mitigation measures to protect the water quality in Killiney Bay during construction and operation of the proposed development:
- 7.1.4.1 Measures to Protect Surface Waters during Construction and Operation
 - 7.1.4.2 Mitigation measures to Protect Ground Water Quality during Construction and Operation

7.2.5 Residual Impacts

- 91 Following the implementation of mitigation measures, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the qualifying interest habitats or species of Rockabill to Dalkey Island SAC, and there are therefore, no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of the Rockabill to Dalkey Island SAC.

7.2.6 Conclusion of Assessment for Rockabill to Dalkey Island SAC

- 92 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of Rockabill to Dalkey Island SAC, the potential impacts, and whether or not the predicted effects would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the Rockabill to Dalkey Island SAC.

7.3 All Other European Sites

7.3.1 Examination and Analysis of Potential Direct and Indirect Impacts

93 The direct and/or indirect impacts by which the proposed development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of any other European Site are:

- The effects of introducing/spreading non-native invasive

7.3.1.1 Habitat degradation as a result of introducing/spreading non-native invasive species

94 The introduction/spreading of non-native invasive species off site, has the potential to affect the suitability of European sites for their QI/SCI species.

95 Affecting the suitability of European sites for Qualifying Interests (QI)/ species of conservation concern (SCI) has the potential to undermine the conservation objectives for those QI/SCI which the sites were designated/ classified for.

7.3.2 Mitigation Measures

96 This section presents the mitigation measures that will be implemented prior to construction and during construction to avoid the introduction/spreading of non-native invasive species to European sites. All of the mitigation measures will be implemented in full and are best practice, and tried and tested, effective control measures to protect the receiving environment, and are included in the site-specific CEMP and Method Statement.

97 See the sections listed below which provide mitigation measures to prevent the introduction/spread of non-native invasive species to European sites prior to construction and during construction of the proposed development:

- 7.1.4.3 Measures to Prevent the Introduction/Spread Of Invasive Species during Construction

7.3.3 Residual Impacts

98 Following the implementation of mitigation measures, the proposed development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the QI habitats or species or SCI of any European sites, and there are therefore, no residual direct or indirect impacts associated with the proposed development that could adversely affect the integrity of any European sites.

7.3.4 Conclusion of Assessment for all other European Sites

99 It has been concluded that the proposed development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the all other European sites.

8 In Combination Assessment

8.1 Analysis of Potential In Combination Effects

- 100 This section of the report presents the assessment carried out to examine whether any other plans or projects have the potential to act in combination with the proposed development to adversely affect the integrity of Dalkey Islands SPA, Rockabill to Dalkey SAC or any other other European sites.
- 101 As assessed in Section 7, following the implementation of mitigation measures none of the potential impacts associated with the proposed development will result in any perceptible residual effect on the receiving environment or on the qualifying interests/special conservation interests of Dalkey Islands SPA, Rockabill to Dalkey SAC and any other European sites. Therefore, there will not be any residual impacts associated with the proposed development that will adversely affect the conservation objectives supporting the conservation condition of the qualifying interests/special conservation interests of those European sites, and the proposed development in isolation will not adversely affect the integrity of those European site.
- 102 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:
- Existing projects (under construction or operational)
 - Projects which have been granted consent but not yet started
 - Projects for which consent has been applied for which are awaiting a decision, including those under appeal
 - Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)
- 103 There is the potential for other pollution sources within the Ovoca-Vartry WFD catchment and any other catchments that also drain to the Southwestern Irish Sea – Killiney Bay to cumulatively affect water quality in the receiving estuarine and marine environments.
- 104 The potential for in combination effects to arise in the Southwestern Irish Sea – Killiney Bay from any existing or proposed land use plans or developments as regulated and controlled by the environmental protective policies and objectives of the Dún Laoghaire-Rathdown County Development Plan 2016-2022. Any existing/proposed plan or project that could potentially affect the Dalkey Islands SPA or the Rockabill to Dalkey Islands SAC, or any other European site, in combination with the proposed development, must adhere to these overarching environmental protective policies and objectives. These policies and objectives will ensure the protection of the European site within the zone of influence of the proposed development, and include the requirement for any future plans or projects to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects.
- 105 There are specific objectives and policies in the Dún Laoghaire-Rathdown County Development Plan 2016-2022 to protect biodiversity, and specifically European sites. Policies LHB19, LHB20 and LHB22, relate to the protection of European sites. The Dún Laoghaire-Rathdown County Development Plan 2016-2022 also includes policies to protect (from risk of pollution), manage and enhance the counties' surface water and groundwater resources (EI2, EI3 and EI4).
- 106 The environmental protective policies and objectives set out in the Dún Laoghaire-Rathdown County Development Plan 2016-2022 are mirrored in the Dún Laoghaire-Rathdown Biodiversity Plan 2009-2013 the Biodiversity action plan sets out a series of actions to protect biodiversity within Dún Laoghaire-Rathdown County Council

8.2 Conclusion of In Combination Assessment

107 As the proposed development itself will not have any effects on the conservation objectives of any European sites, and considering the protective environmental policies and objectives in the Dún Laoghaire-Rathdown County Development Plan 2016-2022, there is no potential for any other plan or project to adversely affect the integrity of any European sites in combination with the proposed development.

9 NIS Conclusion

108 This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the proposed development, the potential impact sources and pathways, how these could impact on the sites' special conservation interest species and whether the predicted impacts would adversely affect the integrity of Dalkey Islands SPA, Rockabill to Dalkey SAC and any other European sites.

109 It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the proposed development, that the proposed development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

Appendix I

Winter Bird Survey Conditions Summary

Date	Survey Time	Sunrise/Sunset	Tide Time	Weather	Disturbance
27/01/2020	13:30-17:30	16:57	High tide (13:03) Low tide (19:02)	Moderate breeze and dry.	None
07/02/2020	07:50-12:00	08:00	High tide (10:05)	Windy and dry	None
24/02/2020	13:30-17:30	17:51	High tide (12:11) Low tide (18:05)	Calm with drizzle at the beginning of the survey.	None
10/03/2020	07:40-11:40	06:51	High tide (11:49) Low tide (04:30)	Overcast, and windy with light rain.	None
26/03/2020	14:50-17:50	18:49	High tide (12:43) Low tide (18:28)	Dry and calm.	Two cats observed on site. People taking bore holes on site.

Appendix II

Desk Study Flora and Fauna Records

Desktop records of protected, rare, or other notable plant species are listed below in **Table 1**. These are plant species which are legally protected under the Flora (Protection) Order, 2015 and/or are listed as Critically Endangered, Endangered or Vulnerable on the relevant national Red Data list for Ireland²⁰.

The majority of the bryophyte species which were added to the revised Flora (Protection) Order, 2015 legislation were considered highly unlikely to occur within the study area, based on a review of the habitat preferences for each species and on the habitats present within the scheme study area.

Table 7: Records of protected, red-listed or notable flora recorded from the desk study in the vicinity of the study area

Common Name/ Scientific name	Legal Status ²¹	Red List Status	Source
Petalwort (<i>Petalophyllum ralfsii</i>)	FPO	Least Concern	NBDC online database record

Desktop records of protected, rare, or other notable fauna species are listed below in **Table 2**. In relation to amphibian, reptile and mammal species those which are protected under the Wildlife Acts, the Habitats Directive and/or are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red Lists are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI) Red List are included in the table below. For invertebrate species, those which are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red List are included.

Table 7: Records of protected, red-listed or notable fauna from the desktop study in the vicinity of the study area

Common Name/ Scientific Name	Legal Status ²²	Red List Status ²³	Source
Amphibians			

²⁰ Vascular flora from Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) *Ireland Red List No. 10: Vascular Plants*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

Bryophytes from Lockhart, N., Hodgetts, N. & Holyoak, D. (2012) *Ireland Red List No.8: Bryophytes*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

²¹ HDII/IV/V = Habitats Directive Annexes II/IV/V; FPO = Flora (Protection) Order, 2015; WA = Wildlife Acts

²² HD_II/IV/V = Habitats Directive Annexes II/IV/V; WA = Wildlife Acts; BD_I/II/III = Birds Directive Annex I/II/III; OSPAR = Convention for the protection of the marine environment of the North-east Atlantic 1992

²³ Mammal Red-list from Marnell, F., Kingston, N. & Looney, D. (2009) *Ireland Red List No. 3: Terrestrial Mammals* and Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*.

Birds from Colhoun, K. & Cummins, S. (2013) Birds of Conservation Concern in Ireland 2014-2019. *Irish Birds* 9:523-544.

Amphibians, reptiles and fish from King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*.

Non-Marine Molluscs from Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2 – Non-Marine Molluscs*.

Butterflies from Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010) *Ireland Red List No. 4 – Butterflies*.

Common Name/ Scientific Name	Legal Status ²²	Red List Status ²³	Source
Common frog <i>Rana temporaria</i>	HD_V, WA	Least concern	NBDC online database record
Smooth newt <i>Triturus vulgaris</i>	WA	Least concern	NBDC online database record
Reptiles			
Loggerhead Turtle (<i>Caretta caretta</i>)	HD_II, WA	n/a	NBDC online database record
Mammals (Marine)			
Grey seal <i>Halichoerus grypus</i>	HD_II & V, WA	n/a	NBDC online database record
Common dolphin <i>Delphinus delphis</i>	HD_IV, WA	n/a	NBDC online database record
Common porpoise <i>Phocoena phocoena</i>	HD_II & IV, WA	n/a	NBDC online database record
Bottle-nosed dolphin <i>Tursiops truncatus</i>	HD_II & IV, WA	n/a	NBDC online database record
Northern Bottlenose Whale <i>Hyperoodon ampullatus</i>	HD_IV, WA	n/a	NBDC online database record
Mammals (Terrestrial)			
Badger	WA	Least concern	NBDC online database record
Otter <i>Lutra lutra</i>	HD_II & IV, WA	Near threatened	NBDC online database record
Brown long-eared bat <i>Plecotus auritus</i>	HD_IV, WA	Least concern	NBDC online database record
Unidentified Pipistrelle spp bat <i>Pipistrellus</i> sp.	HD_IV, WA	Least concern	NBDC online database record
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	HD_IV, WA	Least concern	NBDC online database record
Hedgehog <i>Erinaceus europaeus</i>	WA	Least concern	NBDC online database record NPWS record (M22 and M32)

Moths from Allen, D., O'Donnell, M., Nelson, B., Tyner, A., Bond, K.G.M., Bryant, T., Crory, A., Mellon, C., O'Boyle, J., O'Donnell, E., Rolston, T., Sheppard, R., Strickland, P., Fitzpatrick, U., & Regan, E. (2016) *Ireland Red List No. 9: Macro-moths (Lepidoptera)*.

Damselflies and dragonflies from Nelson, B., Ronayne, C. & Thompson, R. (2011) *Ireland Red List No.6: Damselflies & Dragonflies (Odonata)*.

Water beetles from Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) *Ireland Red List No. 1 – Water beetles*.

Common Name/ Scientific Name	Legal Status ²²	Red List Status ²³	Source
Red squirrel <i>Sciurus vulgaris</i>	WA	Near threatened	NBDC online database record
Pygmy shrew <i>Sorex minutus</i>	WA	Least concern	NBDC online database record NPWS record (M22)
Birds			
Black-headed gull <i>Larus ridibundus</i>	WA	Red	NBDC online database record
Curlew <i>Numenius arquata</i>	BD_II (II), WA	Red	NBDC online database record
Golden plover <i>Pluvialis apricaria</i>	BD_I, II (II), III (III), WA	Red	NBDC online database record
Herring gull <i>Larus argentatus</i>	WA	Red	NBDC online database record
Lapwing <i>Vanellus vanellus</i>	BD_II (II), WA	Red	NBDC online database record
Long-tailed duck <i>Clangula hyemalis</i>	BD_II (II), WA	Red	NBDC online database record
Yellowhammer <i>Emberiza citrinella</i>	WA	Red	NBDC online database record
Barn Swallow <i>Hirundo rustica</i>	WA	Amber	NBDC online database record
Black Guillemot <i>Cephus grylle</i>	WA	Amber	NBDC online database record
Black-legged Kittiwake <i>Rissa tridactyla</i>	WA	Amber	NBDC online database record
Black-tailed Godwit <i>Limosa limosa</i>	WA	Amber	NBDC online database record
Brent Goose <i>Branta bernicla</i>	WA	Amber	NBDC online database record
Common Guillemot <i>Uria aalge</i>	WA	Amber	NBDC online database record
Common tern <i>Sterna hirundo</i>	BD_I, WA	Amber	NBDC online database record
Cormorant <i>Phalacrocorax carbo</i>	WA	Amber	NBDC online database record
Great Black-backed Gull <i>Larus marinus</i>	WA	Amber	NBDC online database record
Great Crested Grebe <i>Podiceps cristatus</i>	WA	Amber	NBDC online database record

Common Name/ Scientific Name	Legal Status ²²	Red List Status ²³	Source
House Martin <i>Delichon urbicum</i>	WA	Amber	NBDC online database record
House Sparrow <i>Passer domesticus</i>	WA	Amber	NBDC online database record
Kestrel <i>Falco tinnunculus</i>	BD_I, WA	Amber	NBDC online database record
Kingfisher <i>Alcedo atthis</i>	BD_I, WA	Amber	NBDC online database record
Lesser Black-backed Gull <i>Larus fuscus</i>	WA	Amber	NBDC online database record
Linnet <i>Carduelis cannabina</i>	WA	Amber	NBDC online database record
Little egret <i>Egretta garzetta</i>	BD_I, WA	Green	NBDC online database record
Little gull <i>Larus minutus</i>	BD_I, WA	Amber	NBDC online database record
Mediterranean Gull <i>Larus melanocephalus</i>	BD_I, WA	Amber	NBDC online database record
Mew Gull <i>Larus canus</i>	WA	Amber	NBDC online database record
Mute Swan <i>Cygnus olor</i>	WA	Amber	NBDC online database record
Northern Gannet <i>Morus bassanus</i>	WA	Amber	NBDC online database record
Oystercatcher <i>Haematopus ostralegus</i>	WA	Amber	NBDC online database record
Peregrine <i>Falco peregrinus</i>	BD_I, WA	Green	NBDC online database record
Razorbill <i>Alca torda</i>	WA	Amber	NBDC online database record
Red-throated diver <i>Gavia stellata</i>	BD_I, WA	Amber	NBDC online database record
Ringed Plover <i>Charadrius hiaticula</i>	WA	Amber	NBDC online database record
Reed Warbler <i>Acrocephalus scirpaceus</i>	WA	Amber	NBDC online database record
Sand Martin <i>Riparia riparia</i>	WA	Amber	NBDC online database record

Common Name/ Scientific Name	Legal Status ²²	Red List Status ²³	Source
Sandpiper <i>Actitis hypoleucos</i>	WA	Amber	NBDC online database record
Sandwich Tern <i>Sterna sandvicensis</i>	BD_I, WA	Amber	NBDC online database record
Shag <i>Phalacrocorax aristotelis</i>	WA	Amber	NBDC online database record
Sky Lark <i>Alauda arvensis</i>	WA	Amber	NBDC online database record
Snipe <i>Gallinago gallinago</i>	BD_I, WA	Amber	NBDC online database record
Starling <i>Sturnus vulgaris</i>	WA	Amber	NBDC online database record
Swift <i>Apus apus</i>	WA	Amber	NBDC online database record
Tree Sparrow <i>Passer montanus</i>	WA	Amber	NBDC online database record
Water Rail <i>Rallus aquaticus</i>	WA	Amber	NBDC online database record
Woodcock <i>Scolopax rusticola</i>	BD_I, WA	Amber	NBDC online database record
Invertebrates			
<i>Enicocerus exsculptus</i>	none	Endangered	
Dark Green Fritillary <i>Argynnis aglaja</i>	none	Vulnerable	NBDC online database record
Wall <i>Lasiommata megera</i>	none	Endangered	NBDC online database record
Field Cuckoo Bee <i>Bombus (Psithyrus) campestris</i>	none	Vulnerable	NBDC online database record