NATURA IMPACT STATEMENT

IN RELATION TO PROPOSED STRATEGIC HOUSING DEVELOPMENT (SHD) AT GREENPARK, LIMERICK CITY

in support of the Appropriate Assessment Process

Prepared for:

On behalf of Voyage Property Limited

Prepared by:

Ecology Ireland Ltd.

September 2021

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Executive Summary

This Natura Impact Statement (NIS) is presented in support of the Appropriate Assessment process to identify whether significant impacts on a Natura 2000 site are likely to arise from a proposed strategic housing development (SHD) in part of the former Greenpark Racecourse, located off Dock Road (N69), Limerick City, Co. Limerick.

Having carried out the Stage 1 Appropriate Assessment Screening, the competent authority may determine that a Stage 2 Appropriate Assessment of the Proposed Development is required as it cannot be excluded, on the basis of objective scientific information following screening under this Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on any European site.

The proposed development site lies within close proximity to two Natura 2000 sites (The Lower River Shannon SAC & The River Shannon and River Fergus Estuaries SPA) and potential for significant effects during the project construction and operational phase cannot be discounted without the implementation of best practice construction and operational design and control measures. Therefore, it cannot be concluded, that the proposed project will not have a significant effect on these Natura 2000 sites, without the consideration and analysis of further information. Therefore Stage 2 NIS (AA) is required.

A Natura Impact Statement (NIS) is presented to provide scientific examination of the project to enable the competent authority to undertake an AA. The NIS examines potential effects to Natura 2000 sites screened in as part of this Screening for Appropriate Assessment; i.e. Lower River Shannon SAC & River Shannon and River Fergus Estuaries SPA. Having taken into consideration the details of the proposed project and the construction mitigation measures proposed in the CEMP, it is concluded that this development would not give rise to any significant effects to designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of features of interest of Natura 2000 sites.

It can be objectively concluded that no significant effects arising from the proposed development are likely to occur in relation to the Natura 2000 sites (i.e. The Lower River Shannon SAC or The River Shannon and River Fergus Estuaries SPA) or indeed any other Natura 2000 site in the wider hinterland.

1 Introduction

Ecology Ireland Wildlife Consultants Ltd. was commissioned by Voyage Property Limited to undertake a Natura Impact Statement (NIS) in support of the Appropriate Assessment process, in relation to a proposed strategic housing development (SHD) at the former Greenpark Racecourse, located off Dock Road (N69) Limerick City, Co. Limerick. This assessment was undertaken as part of an application by the client for planning permission, where European designated conservation sites are present in the surrounding area.

1.1 Statement of Competence

This NIS, in support of the Appropriate Assessment process, for a proposed strategic housing development at Greenpark, Co. Limerick was prepared by a team of specialist ecologists led by Dr. Gavin Fennessy (BSc PhD MCIEEM). Dr. Fennessy has over 20 years of experience in professional consultancy. He is the Director & Principal Ecologist of Ecology Ireland Wildlife Consultants and this role has contributed to and Project Managed numerous impact assessment projects including EcIA, EIAR, AA, SEA etc. Gavin is a trained and experienced Expert Witness having presented expert testimony at several An Bord Pleanála Oral Hearings.

Athena Michaelides (BSc Zoology & Animal Biology) has over five years of experience as a professional ecological consultant. She is a former secretary of the Irish Wildlife Trust with particular experience in field surveys and reporting as part of Ecological Impact Assessment.

Claire Deasy (BSc MSc) is an experienced ecological consultant with over 15 years of experience. She is a habitat and botanical specialist and is particularly skilled in preparation of impact assessments and screening and NIS reporting in support of the AA process.

Ross Macklin (BSc PhD MCIEEM) is one of Ireland's leading authorities on freshwater biology with over 15 years of experience in ecological consultancy. Ross carried out field studies on the wider aquatic ecology of the areas close to the former Greenpark Racecourse.

1.2 Proposed Development Site

The proposed development site of 10.5ha is located within the lands of the former Greenpark Racecourse, located off Dock Road (N69), on the western edge of Limerick City (see Figure 1-1). Detailed ecological surveys have been undertaken which have covered the proposed development site and the surrounding area, including all of the lands at this site that are in the ownership of the Applicant. In this report we will refer to 'study site' when discussing the former racecourse and surrounding lands and application site (or proposed development site) when referring specifically to lands within the proposed SHD development.

The study site is located within the Ballynaclogh_SC_010 sub catchment and the Shannon Estuary South sub-catchment, Hydrometric Area 24 in the Shannon River Basin District.

The Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River. These river and transitional water bodies ultimately discharge into the Upper Shannon Estuary (IE_SH_060_0800).

The project lies within the 'Limerick City Southwest' groundwater body (SH-G-141). This water body has achieved 'Good' status during the 2013-2018 Water Framework Directive (WFD) monitoring cycle. However, the 2010-2015 monitoring programme recorded 'Poor' status as a result of impact of groundwater on surface water ecological status which were attributed to nutrient pressures from agriculture (EPA, www.catchments.ie). The Ballynaclogh_010 has a WFD status of "Unassigned".

The proposed development site lies within two 2km Grid Squares (R55M and R55S) of the National Biodiversity Database Centre (NBDC). These grid square contained records of high impact invasive species Japanese Knotweed *(Fallopia/ Reynoutria japonica*); 1 record) and Giant Hogweed (*Heracleum mantegazzianum*; 1 record). Records of Butterfly bush (*Buddleja davidii*) and Himalayan honeysuckle (*Leycesteria formosa*) were also recorded within the grid squares.

Intensive ecological surveys were undertaken from June 2020 to March 2021 covering the proposed SHD site and the adjoining lands.

Industrial estates lie to the north and west of the study site with residential developments to the east of the study site.

1.3 Proposed Development

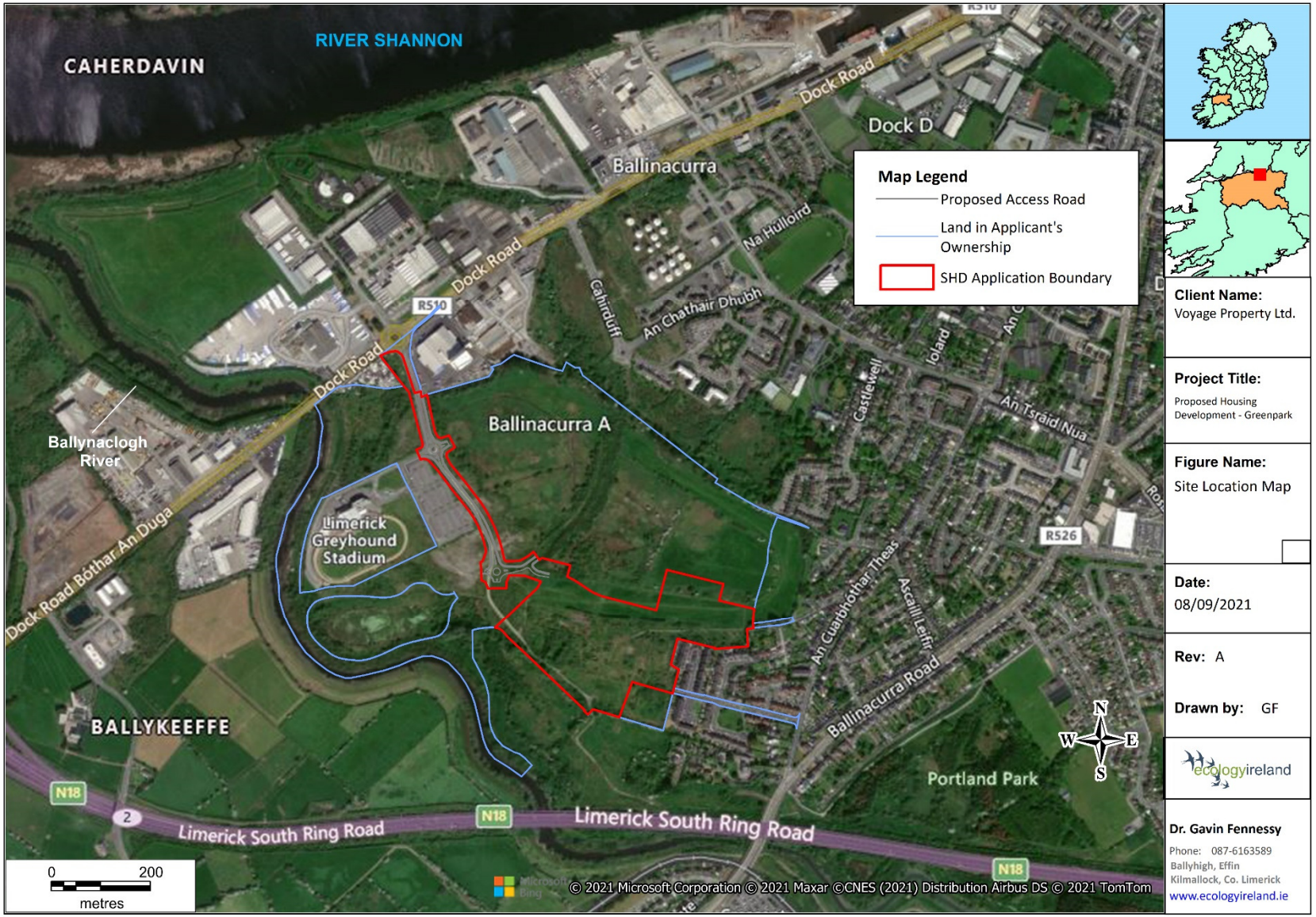
Voyage Property Limited intend to apply to An Bord Pleanála (the Board) for permission for a strategic housing development with a total application site area of c.10.5 ha (with a substantive residential site development area of c.7.9 ha), on lands at the former Greenpark Racecourse, located off Dock Road (N69), Limerick, principally bounded by existing undeveloped lands to the north, south and west and the adjoining Log na gCapall Housing Estate to the east.

The application site includes the proposed access road (374m in length; 6-14m in width; a roundabout; cycle lands and pedestrian footpath) which joins into the Dock Road at the north-western corner of the former Greenpark Racecourse lands and runs adjacent to the Limerick Greyhound Track.

The proposed SHD development is described as follows:

The development with a total gross floor area of c. 36,329m^2 will consist of the provision of 371 no. residential units comprising 157 no. two storey houses (consisting of 10 no. 4 bedroom units, 110 no. 3 bedroom units and 37 no. 2 bedroom units); 76 no. three storey duplex units (consisting of 14 no. 3 bedroom units, 38 no. 2 bedroom units and 24 no. 1 bedroom units) and 138 no. apartments (consisting of 92 no. 2 bedroom units and 46 no. 1 bedroom units arranged in 3 no. blocks ranging between 4 and 5 storeys together with communal amenity space) and a childcare facility (550 sq m), including all private, communal and public open space provision (including balconies and terraces to be provided on to front and rear elevations and related play areas) surface car parking (510 no. spaces in total, including car sharing and accessible spaces); electric vehicle charging points; bicycle parking (long and short stay spaces including secure stands); storage areas; internal roads and pathways; hard and soft landscaping and boundary treatments; piped infrastructural services and connections; plant; revised entrances and tie-in arrangements to adjoining roads, including emergency access via Log na gCapall; waste management provision; solar panels; attenuation tank and related SUDS measures; signage; public lighting; bulk earthworks; and all site development and excavation works above and below ground. Vehicular access to the site will be from Dock Road, via the proposed access road.

Figure 1-1 Site location map.



1.4 Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as European Sites. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European Sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA);

> *Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In 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.*

Article 6(4) states;

> *If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of European Site is protected. It shall inform the Commission of the compensatory measures adopted.*

2 The Appropriate Assessment Process

2.1 Guidance for the Appropriate Assessment Process

Article 6(3) of the EU Habitats Directive (92/43/EEC) defines the requirement for AA of certain plans and projects. In order to inform the requirements of this Screening and NIS the following guidance documents have been referred to;

European and National Legislation

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (also known as the 'Habitats Directive');
- Council Directive 2009/147/EC on the conservation of wild birds, codified version, (also known as the 'Birds Directive');
- European Communities (Birds and Natural Habitats) Regulations 2011 to 2015; and
- Planning and Development Act 2000 (as amended).

Guidance

- European Commission (2015) Ecological flows in the implementation of the Water Framework Directive – Guidance Document No. 31.
- European Court of Justice, Case – C-664/15
- European Court of Justice, Case – C117/00
- European Court of Justice, Case – C461/13
- European Court of Justice, Case – C323/17
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environmental Heritage and Local Government.
- European Commission (2018) Managing European Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- European Commission (2000) Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg. European Commission.
- European Commission (2001) Assessment of plans and projects significantly affecting European Sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.
- European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of

overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.

- European Commission (2013). Interpretation Manual of European Union Habitats. Version EUR 28. European Commission

Judgements (National & EU)

- European Court of Justice Ruling 11th April 2013 Case C−258/11 Peter Sweetman and Others v An Bord Pleanála - Criteria to be applied when assessing the likelihood that N6 Galway City Outer Bypass road scheme will adversely affect the integrity of Lough Corrib SAC
- High Court Ruling 25th July 2014 by Ms. Justice Finlay Geoghegan; Neutral Citation [2014] IEHC 400; High Court Record No. 2013 802 JR; Kelly -v- An Bord Pleanála – Judicial review of grant of planning by An Bord Pleanála for two wind farm phases in County Roscommon.
- High Court Ruling 24th November 2014 by Mr. Justice Hedigan; Neutral Citation [2014] IEHC 557; High Court Record No. 2014 320 JR; Rossmore Properties Limited & Anor -v- An Bord Pleanála.
- High Court Ruling 25th February 2016 by Mr. Justice Barton. Neutral Citation [2016] IEHC 134; High Court Record No. 2013 450 JR; Balz & Anor -v- An Bord Pleanála.
- European Court of Justice ruling 12th April 2018 in respect of Case C-323/17 (People Over Wind & Sweetman) - it is not appropriate for the purposes of Appropriate Assessment (AA), at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of a plan or project.
- European Court of Justice ruling 19th April 2018 in respect of Case C-164/17, Compensation vs Mitigation, Grace & Sweetman Vs ABP.
- European Court of Justice 7th November 2018; Case C 461/17; Holohan & Others v. An Bord Pleanála - an Appropriate Assessment must identify and examine the implications of the proposed project for species present on the Natura 2000 site, including species for which the site has been listed and those for which it has not, provided those implications are liable to affect the conservation objectives of the site; an Appropriate Assessment must identify and examine the implications of the proposed project for species and habitats outside the boundaries of the Natura 2000 site, provided those implications are liable to affect the conservation objectives of the site.
- High Court Ruling 2nd February 2019 by Mr. Justice Barniville; Neutral Citation [2019] IEHC 84; High Court Record No. 2017 883 JR; Kelly -v- An Bord Pleanála & Anor- SUDS are not mitigation measures which a competent authority is precluded from considering at the stage 1 screening stage.
- Heather Hill Management Company CLG v An Bord Pleanála (Burkeway Homes Limited as Notice Party) [2019] IEHC 450. Mr. Justice Garrett Simons granted an order of certiorari setting aside the decision of the Board to grant permission for a residential development of 197 units at Bearna Co. Galway, on the basis that it was a material contravention of the Galway

County Development Plan (the CDP), it failed to carry out a 'justification test' as required and failed to carry out proper Appropriate Assessment screening.

- High Court Ruling 31st January 2020 by Mr. Justice Denis McDonald; Neutral Citation [2020] IEHC 39; High Court Record No. 2019 33 JR; Peter Sweetman -v- An Bord Pleanála , Ireland and The Attorney General – the competent authority was not entitled to take the measures described in the CEMP into account in carrying out the screening exercise for appropriate assessment in this particular solar farm development case, where the CEMP referenced protection of the River Blackwater that also overlapped with the SAC here.

Departmental/ NPWS Circulars

- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10. (DoEHLG, 2010);
- Appropriate Assessment of Land Use Plans. Circular Letter SEA 1/08 & NPWS 1/08;
- Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Circular L8/08;
- Guidance on Compliance with Regulation 23 of the Habitats Directive. Circular Letter NPWS 2/07; and
- Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment (EIA); or (2) having potential impacts on European Sites. Circular Letter PD 2/07 and NPWS 1/07.

2.2 Stages of Article 6 Assessment

The European Commission's guidance promotes a staged process, as set out below, the need for each being dependent upon the outcomes of the preceding stage:

(1) Screening

(2) Appropriate Assessment

(3) Assessment of Alternative Solutions

(4) Assessment where no alternative solutions remain and where adverse impacts remain. The "IROPI test" (Imperative Reasons of Over-riding Public Interest) and compensatory measures.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures.

Stage 1 of the process is intended to identify whether the project is 'likely to have a significant effect' upon a European site, referred to as 'Screening for Appropriate Assessment'.

If the screening process identifies effects to be significant, potentially significant or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening is undertaken without the inclusion of mitigation, unless potential impacts clearly can be

avoided though the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan or project. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

Section 177U of the Planning and Development Act 2010 (and Article 42, Birds and Habitats Regulations, 2011) states that; "*the competent authority shall determine that an appropriate assessment of the 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 not have a significant effect on a European site*."

Stage 2 of the process, Appropriate Assessment, considers any potential impacts of the plan or project in greater detail including whether further mitigation measures are required. Specifically, it is focused on the potential for the proposed plan or project to impact on the conservation objectives of the European Sites and the integrity of the European Sites. This stage involves the collection of information which is specifically relevant to determining impacts including a description of the proposed plan or project, the conservation objectives of the European Sites and an understanding of current factors which either maintain or threaten those conservation objectives, an assessment of aspects of the proposed plan or project which could negatively impact the conservation objectives of the European Sites, both in the absence of and with mitigation measures.

If an adverse impact upon the site's integrity cannot be ruled out, then **Stage 3** will need to be undertaken to assess whether alternative solutions exist. If no alternatives exist that have a lesser effect upon the European Site/s in question, the project can only be implemented if there are 'imperative reasons of overriding public interest', **Stage 4**, as detailed in Article 6(4). In essence, the work at Stage 1 will determine whether further stages of the process are required.

2.3 Methodology

In complying with the obligations under Article 6 (3) and following the European Commission's Guidelines the approach to the AA process and preparation of the NIS for this proposal is set out below:

I. Description of the proposed works.
II. Identification of Natura 2000 sites potentially affected and compilation of information on their qualifying interests and conservation objectives.
III. Identification and description of potentially significant impacts likely to result from the proposed works.
IV. Exclusion of sites and impacts at Stage 1 Screening where it can be objectively concluded that there will be no significant effects.
V. Stage 2 assessment of the significance of likely potentially significant impacts identified during Stage 1 and development of mitigation measures to the point where no adverse effects remain and
VI. Concluding NIS Statement.

3 Brief Description of the Site & Project

3.1 Desk Based Studies:

A desk-based study was carried out to collate the available ecological information on the ecological environment in the footprint of the works. The following sources of information where consulted:

- The National Parks and Wildlife Service (NPWS) website www.npws.ie was consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment.
- The National Biodiversity Data Base Centre website www.nbdc.ie was consulted with regard to species distributions.
- Aerial imagery was consulted in order to get a broad overview of the habitats present in the vicinity of the site.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD), Geological Survey of Ireland (GSI) & Inland Fisheries Ireland (IFI).
- Review of the Bat Conservation Ireland (BCI) Private Database.
- Review of the publicly available National Biodiversity Data Centre (NBDC) webmapper.
- Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes.
- Inland Fisheries Ireland (IFI) Reports.
- Records from the National Parks and Wildlife Services ('NPWS') WS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectad in which the Proposed Development is located.
- Review of NPWS Article 17 Metadata and GIS Database Files

3.2 Field Based Studies:

Intensive ecological surveys were completed over the period of June 2020 – March 2021 in the form of:

- Habitat and Botanical Survey
- Aquatic Ecology Survey
- Mammal Camera Survey (June 2020 – February 2021)
- Mammal Walkover Survey
- Active bat detector Survey (Summer/Autumn 2020; BCT 2012)
- Passive bat detector Survey (Summer 2020 through to Spring 2021)
- Other Fauna Survey (Amphibians, Invertebrates)

The extensive surveys were important in describing the local ecology, particularly in the context of nearby designated Natura 2000 sites and their qualifying and special conservation interests. These data helped understand the ecological relationships and the relative importance of the proposed SHD development site taken in the context of the wider area.

3.2.1 Habitat and Botanical Survey

The habitat and flora field assessment was carried out in accordance with best practice guidance (Smith *et al.* 2011). This involved a dedicated walkover of the entire lands under the Applicant's ownership at this site on a number of occasions between June and August 2020. An objective of the field assessments was to gain an overview of the development site, as well as to note ecological points of interest such as the presence of invasive plant species and species that are protected or are part of the qualifying interests of the Natura 2000 sites relevant to this assessment.

No plant species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (i.e. species of which it is a legal offense to disperse, spread or otherwise cause to grow in any place) or classified as a 'risk of high impact invasive species' (Kelly et al. 2013) were recorded within the study site. In total five non-native invasive plant species were recorded during the 2020 habitat survey: Himalayan honeysuckle (*Leycesteria formosa*) (Medium Impact), Fuchsia (*Fuchsia magellanica*), Buddleia (*Buddleja davidii*) (Medium Impact), Travellers Joy (*Clematis vitalba*) (Medium Impact), Montbretia (*Crocosmia pottsii x aurea = C. x crocosmiiflora*) and Sycamore (*Acer pseudoplatanus*).

3.2.2 Birds

A series of dedicated breeding and wintering bird surveys were carried out each month from October 2020 to March 2021. A baseline bird assessment of the study area was completed by undertaking a series of line transect surveys (see Bibby *et al*. 2000 and Sutherland et al. 2004). A total of five transects, each of approximately 500m length were surveyed across the study area, ensuring that an adequate distance was maintained between them in order to minimise double-counting individual birds across the site. Two breeding bird survey walkovers were carried out in the summer months of 2020 and the same transects were surveyed on a total of three occasions during the winter of 2020/2021. On each transect, all bird species encountered (seen or heard) within three distance bands from the observer were recorded (<25m, 25-100m and >100m) and their abundance noted.

Given the low-lying and relatively undisturbed nature of the former racecourse lands it was important to ascertain if there was any usage of the proposed development site and adjoining lands by wintering birds, particularly those listed as special conservation interests (SCIs) of the nearby SPA. In daylight the site was walked to record the presence/absence of any of these SCI species and after dark a pair of ecologists walked the site using a Thermal Imaging Scope (Pulsar Helion 2 XP 50) to scan the grasslands and any pooled or waterlogged areas for signs of the presence of such species. The thermal imager uses an IR sensor (uncooled microbolometer) which does not require an external light source and is not affected by bright light exposure. The scope can detect and record bird and mammal activity at several hundred metres distance.

Two Red-listed species were recorded during the breeding season transect survey; Meadow Pipit (*Anthus pratensis*) and Swift (*Apus apus*). During casual observations of the site three further Red Listed species were recorded; Grey Wagtail (*Motacilla cinerea*), Kestrel (*Falco tinnunculus*) and Snipe (*Gallinago gallinago*).

3.2.3 Mammals

A mammal survey of the site was also undertaken which involved a walkover of the site, identifying mammal species or signs of mammal activity seen (e.g. droppings, tracks, burrows etc.) and recording observations using field notes and/or handheld GPS units. Techniques used to identify mammal activity followed recognised guidelines (e.g. Clark 1988, Sutherland 1996, Bang & Dahlstrom 2004 and JNCC 2004). The mammal survey walkovers were carried out by Dr. Gavin Fennessy, assisted by Tom O'Donnell and Marie Kearns.

In addition, a number of digital trail cameras (Camera-traps) which take photographs and/or video when triggered by heat or motion, were also deployed at the site to record mammal activity within and adjacent to the proposed development site. All cameras (Browning Dark Ops HD) were deployed at a total of 14 sampling locations around the study area for an average of 42 days. The cameras were set to take still images which were later analysed to identify the mammal (and bird) species present. The cameras are equipped with no-glow infrared 'flash' technology which enable clear night-time (as well as diurnal) images to be captured. Cameras were rotated between sampling locations with several cameras on-site from June 2020 through to March 2021.

No breeding sites, or burrows for any protected mammal species were recorded during the walkovers in the vicinity of the proposed development site.

3.2.4 Bats

There are no suitable structures on the proposed development site or in the adjoining lands under the Applicant's ownership which have potential for roosting bats. A visual assessment was made of the roost potential of natural and man-made features within and adjoining the proposed development site.

In order to record the usage of the proposed development site and surrounding areas by bats, a multi-season deployment of passive bat detectors was carried out. Multiple bat detectors (Wildlife Acoustics SM4 & SM4 Mini) were deployed at a total of 16 locations in the area between July 2020 and March 2021.

The survey generated a large dataset of bat calls (registrations) for analysis using Kaleidoscope Pro software. The registrations captured during each deployment were identified using *post hoc* analysis and the relative abundance of the species identified was calculated. The activity pattern of key species was investigated further to ascertain if the pattern of occurrence was suggestive of the presence of locally roosting bats.

The conservation of Bat species was considered. All Irish bat species and their breeding, roosting and resting locations are legally protected under both the Irish Wildlife Acts (1976 - 2010) and as Annex IV species in the EU Habitats Directive (92/43/EEC).

A total of 6 bat species were confirmed to be present in the study area: Common Pipistrelle (*Pipistrellus pipistrellus)*, Soprano Pipistrelle (*Pipistrellus pygmaeus)*, Leisler's Bat (*Nyctalus leisleri)*, Daubenton's Bat (*Myotis daubentoniid)*, Brown Long-eared Bat (*Plecotus auratus)* and Lesser Horseshoe Bat (*Rhinolophus hipposideros)*.

3.3 Study Site: Location

The study site is located on the lands at the former Greenpark Racecourse, located off Dock Road (N69), on the western edge of Limerick City (see Figure 1-1 above). The subject site comprises approximately 10.5 hectares located in the townland of Ballinacurra (Hart) in Limerick City (ITM 557013, 657182). The northernmost part of the existing access road from Dock Road is situated in the townland of Corkanree. The site is principally bounded by existing undeveloped lands to the north, south (open land, formly part of the racecourse) and west (open ground with the greyhound track) and the adjoining Log na gCapall Housing Estate to the east. Vehicular access to the site will be from Dock Road, via the proposed access road.

The closest Natura 2000 sites are The Lower River Shannon Special Area of Conservation (SAC), located approximately 0.06km west and The River Shannon and River Fergus Estuaries Special Protection Areas (SPA) located approximately 0.13km west (See Figure 3-1 below).

Figure 3-1 Designated Natura 2000 sites within wider hinterland of proposed development site at Greenpark, Co. Limerick

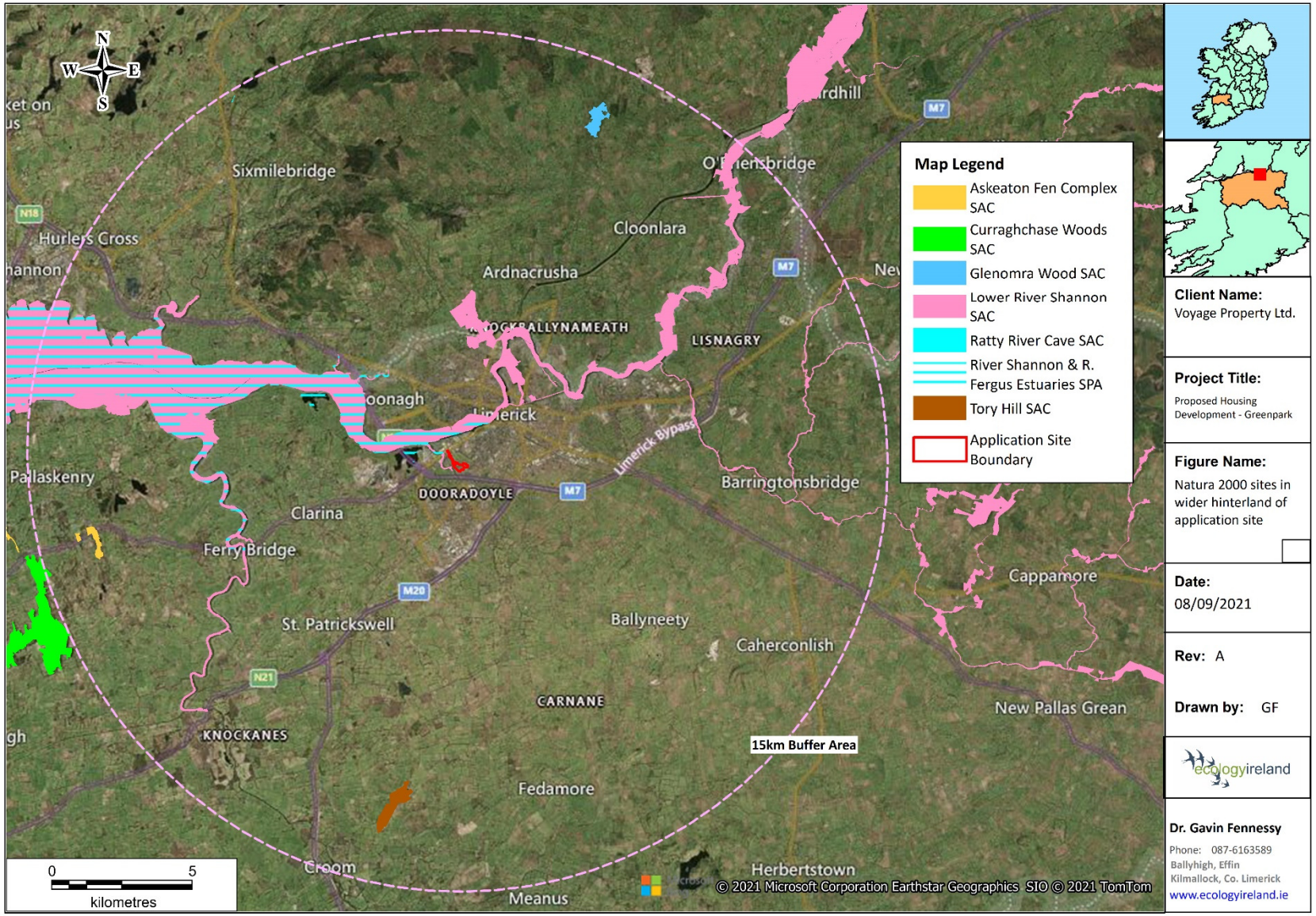
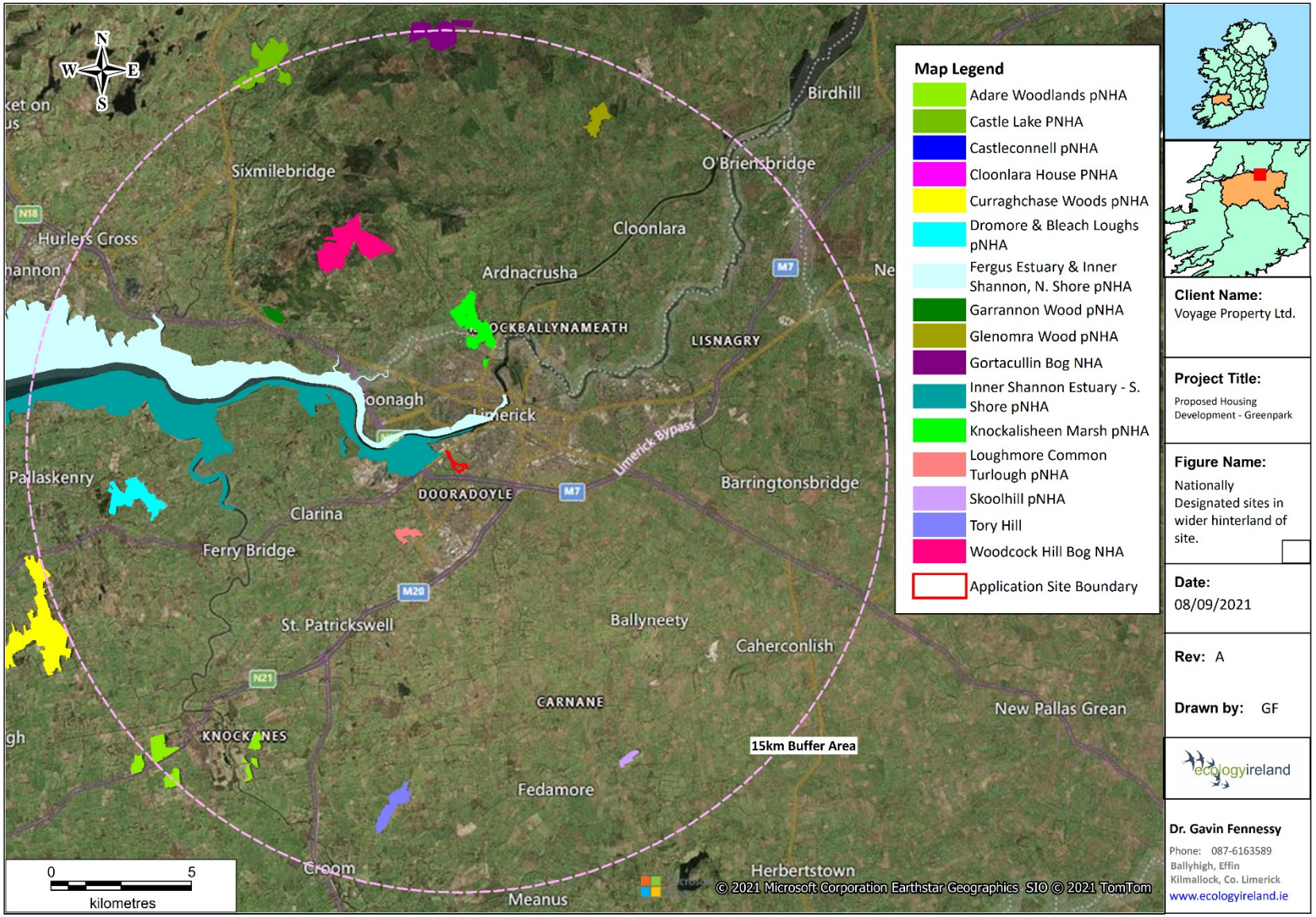


Figure 3-2 Nationally Designated sites in wider hinterland of proposed development site.



3.4 Project Details

3.4.1 Proposed Development Overview

Voyage Property Limited intend to apply to An Bord Pleanála (the Board) for Planning Permission for a strategic housing development (SHD) on a total application site area of c.10.5 ha (with a substantive residential site development area of c.7.9 ha) on the lands at the former Greenpark Racecourse located off Dock Road (N69) in Limerick City, Co. Limerick.

The application site includes the proposed access road (374m in length; 6-14m in width; a roundabout; cycle lands and pedestrian footpath) which joins into the Dock Road at the north-western corner of the former Greenpark Racecourse lands and runs adjacent to the Limerick Greyhound Track. The development with a total gross floor area of c. 36,329m^2 will consist of the provision of 371 no. residential units.

The construction phase will require the clearance of some vegetation, mostly immature woodland (WS2) and Scrub (WS2) that has developed on the grassland at the former racecourse. The clearance of vegetation has the potential to disturb and displace some non-volant mammal species. Vegetation clearance also has the potential to directly impact mammals that may be present. It can also result in a localised loss of foraging, resting and breeding habitat for certain species. No removal of habitats or movement of construction machinery will occur outside of the development works area/footprint during the construction phase. Existing trees and hedgerows shall be retained where possible.

The design intent is to create a high quality and appropriate landscape for future residents which will meet their recreational needs and provide an attractive visual setting and associated social amenity spaces. The landscape strategy also seeks to create a permeable network of green infrastructure and open spaces throughout the development and pay attention to future links to the development lands outside this application boundary.

There will also be approximately 520 new trees planted with the development and the Open Spaces. Additionally, there will be 1,700 sqm of native woodland planting specified, further bolstering the green infrastructure network.

Some of these species will include; Oak (*Quercus robur*), Rowan (*Sorbus aucuparia*), Pine (*Pinus sylvestris*), Whitebeam (*Sorbus aria*), Willow (*Salix spp*), Alder (*Alnus glutinosa*), Birch (*Betula pendula*) which will be planted in the open spaces of the development. Hornbeam (*Carpinus betulus*), *Tilia cordata* 'Greenspire', *Platanus orientalis* 'Minaret' will be planted along the link roads. On the local roads Alder (*Alnus glutinosa*), Birch (*Betula pubescens*) and Rowan (*Sorbus aucuparia*) will be planted. Hazel (*Corylus avellana*), Cherry (*Prunus avium*), *Pyrus* 'Chanticleer', Crab Apple (*Malus sylvestris*) and Silver Birch (*Betula pendula*) will be planted in small residential streets and home zones.

There is an existing surface water drainage network within the Greenpark site in the form of a regional Sustainable urban Drainage System (SuDS) attenuation (Lagoon) and a strategic conveyance system (pipework).

The development site adjoins an existing Constructed Wetland with a built capacity of c. 23,000m^3 based on the topographical survey, which is capable of servicing an area of 39 hectares, while the total application

site of the SHD site is circa 10.5ha. During the operational phase, surface water run-off at the site will be collected by a new surface water sewer network in the proposed development, which will link to the existing Constructed Wetlands, and which ultimately discharges to the Ballynaclogh River (See Chapter 8 Biodiversity of the EIAR.).

A new surface water sewer network shall be provided for the proposed development which will be entirely separate from the foul water sewer network. Surface water run-off from roof areas and hardstanding areas are designed to be collected by a gravity pipe network. Surface water will be collected and discharged via a mixture of traditional and sustainable (SuDS) drainage to the existing 1350mm/1500mm diameter surface water sewer. Each unit will have its own independent connection to the surface water sewer network. All SuDS measures are to be implemented with reference to the UK Suds Manual and Limerick City & County Council water services department requirements.

The minimum diameter of the mainline surface water sewers is 225mm and minimum horizontal and vertical separation distances between the proposed drainage and other services are as per the Irish Water Code of Practice.

It is proposed that surface water will discharge via attenuation tanks, a class 1 bypass separator and flow control device prior to discharging to the existing surface water network. The surface water drainage network has been analysed for the risk of flooding for a 1 in 5-year flood event, 1 in 30- year rainfall event and a 1 in 100-year rainfall event by means of simulating such events in the drainage model with no flooding occurring. An increase of 20% in rainfall has been included to account for climate change and 10% for urban creep. Please refer to Appendix D of Punch Consulting Engineers Engineering Report for the development for detailed calculations.

A proposed residential development for 31 units was granted planning on Greenpark Avenue (LCCC Ref: 17/1190; ABP PL91.302015). The development allowed for the attenuated surface water network to discharge to the existing surface water network within Greenpark with a restricted discharge rate of 9l/s. As part of the Greenpark housing development, it is proposed to provide an attenuation tank to accommodate surface water flows from the Greenpark Avenue development. The attenuation tank has been designed for a 1 in 30-year rainfall event and a 1 in 100-year rainfall event with a 20% allowance for climate change.

It is proposed that the surface water sewer from Log na gCapall will be accommodated via a separate surface water sewer which will discharge to the existing 1350mm/1500mm diameter surface water sewer. The proposed surface water drainage network has also been designed to allow for future residential and nursing home development projects within Greenpark.

The SuDS proposals in place for the development site include; Green Roofs, Tree Pit Systems, Permeable Paving, Infiltration Trenches, Rain Gardens and Swales. These will contribute to reducing and restricting the discharge rate from the site. It is proposed to attenuate surface water from the proposed development with appropriately sized attenuation tanks located in open spaces throughout the development. The proposed attenuation tanks have been designed to reduce the peak runoff from the site. The attenuation tank has been sized to cater for a 1:100 storm event with a 20% allowance for climate change and 10% for urban creep. Please refer to Appendix D of Punch Consulting Engineers Engineering Report for supporting calculations.

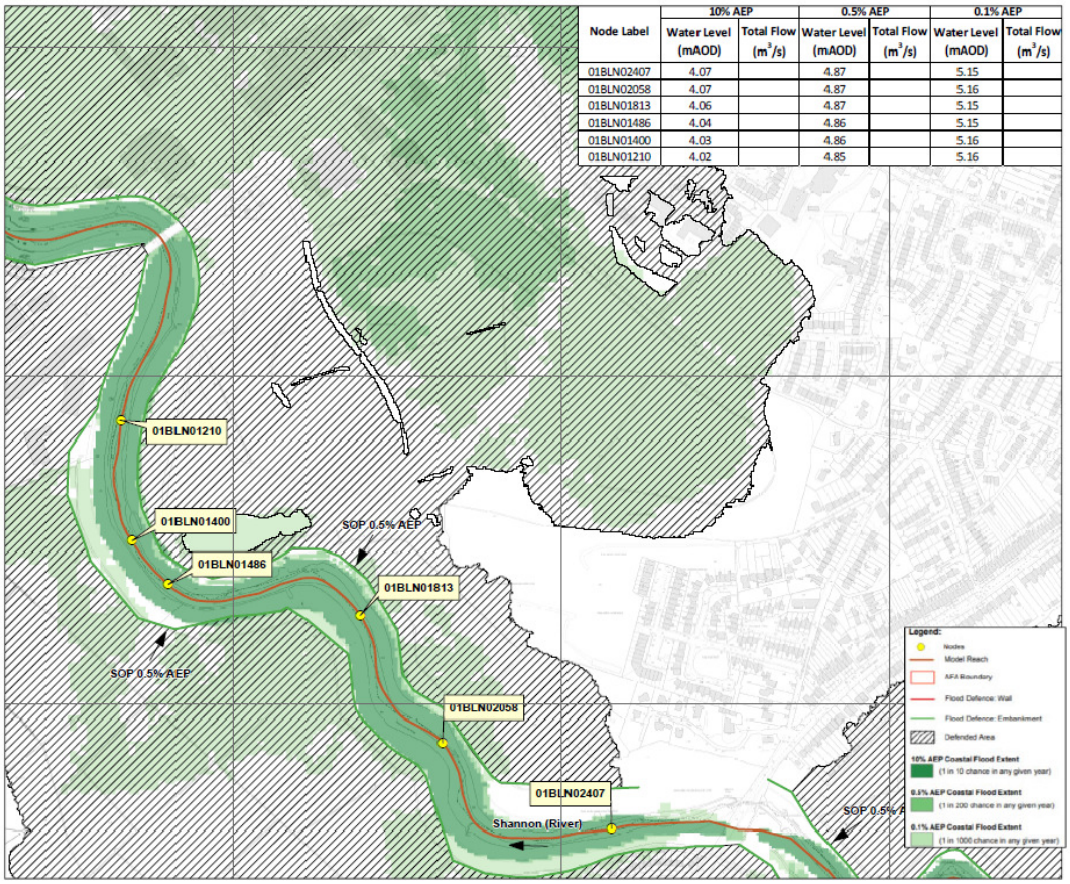
Wastewater generated on-site particularly during the operational phase of the development will be piped and discharged to the existing Irish Water foul sewer. Irish water has provided agreement in principle for the connection of the development associated with the SHD to their assets and have confirmed that the Bunlicky WWTP has adequate capacity for the development. Provided the sewer network is installed using industry standard best practice, and routinely checked there is likely to be no impact from wastewater from the development (See Chapter 10 (Hydrology) of the EIAR).

The River Shannon flows at a distance of approximately 500m to the north and one of its tributaries, the Ballynaclogh River, flows to the west of the site. The Flood Risk Screening Assessment indicates that there is a line of existing flood defences along both the Ballynaclogh River and the River Shannon which offer a good standard of protection to this area of Limerick. The defences along the Ballynaclogh River and the Shannon Estuary were built by the OPW under the Arterial Drainage Act, 1945. Both the Ballynaclogh River and the River Shannon can be considered to be tidal at this location. As part of the Shannon Catchment Flood Risk Assessment and Management (CFRAM) Study, Limerick was identified as an Area for Further Assessment (AFA). The CFRAM mapping and the levels derived from the RPS study as part of the current application provide the best available information to assess the flood risk to proposed development site. The maps below (See Figure 3-3 and Figure 3-4) give an overview of the 10% AEP, 0.1% AEP and indicate that the 0.5% AEP flood event does not reach the application site.

The development will be constucted in phases, as is commonplace for large housing developments. The objective of the phasing will be to fully complete blocks of the development and to minimise interactions between residents and the construction operations as much as possible.

A Construction Environmental Waste Management Plan (CEMP) has been completed for the proposed development describing the standard good housekeeping management (*e.g.* spill kits, bunded oil containers, plant/machinery maintenance) that will be applied throughout the construction phase (See accompanying CEMP; GDG 2021). In addition, a Construction phase Waste Management Plan (CWMP) and an Operation stage Waste Management Plan (OWMP) have been prepared (GDG, 2021) and accompany the planning application.

Figure 3-3 10% AEP, 0.5% AEP and 0.1% AEP extract from CFRAMS tidal flood extents map of the Ballynaclogh RIver



Node Label	10% AEP		0.5% AEP		0.1% AEP	
	Water Level (mAOD)	Total Flow (m^3/s)	Water Level (mAOD)	Total Flow (m^3/s)	Water Level (mAOD)	Total Flow (m^3/s)
01BLN02407	4.07		4.87		5.15	
01BLN02058	4.07		4.87		5.16	
01BLN01813	4.06		4.87		5.15	
01BLN01486	4.04		4.86		5.15	
01BLN01400	4.03		4.86		5.16	
01BLN01210	4.02		4.85		5.16	

Figure 3-4 Flood depth map showing 0.5% AEP impact flood inundation simulation (CFRAMS data).

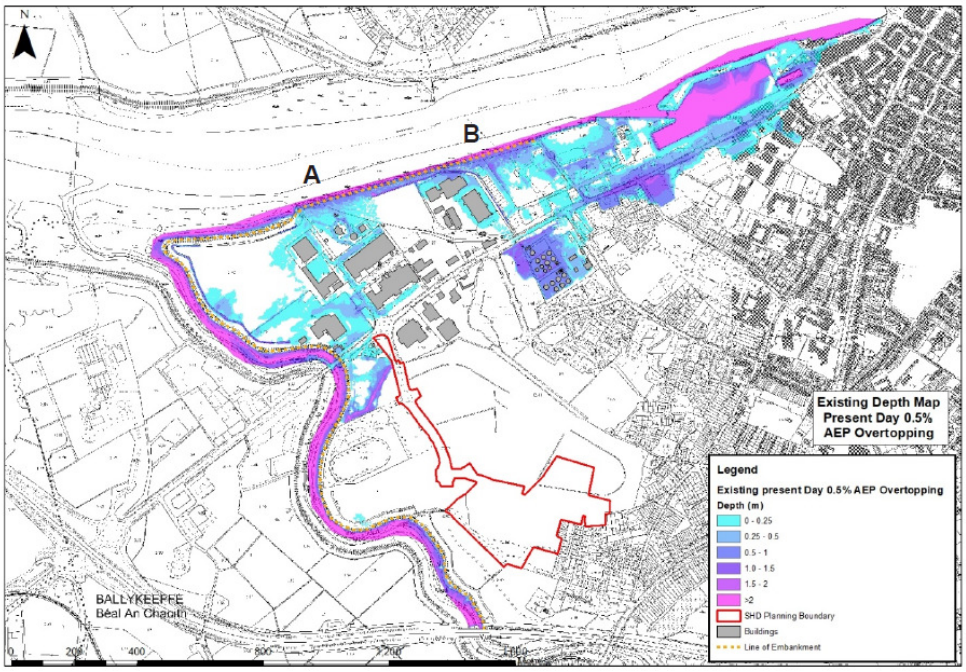


Figure 3-5 Proposed SHD layout (Reddy Architects).

4 Identification of Natura 2000 Sites

In accordance with the European Commission Methodological Guidance (ED2001), a list of European Sites that can be potentially affected by the proposed SHD development at Greenpark has been complied. All Special Areas of Conservation (SAC's) and Special Protection Areas (SPA's) sites within a nominal 15km radius of the proposed development site have been shown on the associated mapping and data tables. A primary exercise, whereby the potential for a wider zone of influence (than 15km) was considered using the source-pathway-receptor model. It was concluded that there were no likely significant effects on any Natura 2000 sites beyond the nominal 'search distance' arising from the proposed development.

The Natura 2000 sites in the wider hinterland are described in Table 4-1 below. These Natura 2000 site locations can also be seen in Figure 3-1 and Figure 3-2 above.

No NHA sites are located within 15km of the proposed works. Table 4.2 details the pNHA sites located in the wider area.

Table 4-1 NATURA 2000 SITES WITHIN 15KM OF PROPOSED DEVELOPMENT.

Natura 2000 sites	Site Code	Minimum Distance from proposed works
Lower River Shannon SAC	002165	0.06km
River Shannon & River Fergus Estuaries SPA	004077	0.13km
Tory Hill SAC	000439	11.19km
Glenomra Wood SAC	001013	12.34km
Askeaton Fen Complex SAC	002279	12.75km
Ratty River Cave SAC	002316	14.59km
Curraghchase Woods SAC	000174	14.76km

Table 4-2 pNHA SITES WITHIN 15KM OF PROPOSED DEVELOPMENT.

pNHA Sites	Site Code	Minimum Distance (km)
Inner Shannon Est. – South Shore pNHA	000435	0.12km
Fergus Est. & Inner Shannon – North Shore pNHA	002048	0.59km
Loughmore Common Turlough pNHA	000438	2.52km
Knockalisheen Marsh pNHA	002001	3.25km
Woodcock Hill pNHA	002402	7.33km
Garrannon Wood pNHA	001012	7.38km
Cloonlara House pNHA	001012	8.37km
Castleconnell pNHA	000433	9.72km
Dromore & Bleach Loughs pNHA	0001030	10.18km
Tory Hill pNHA	000439	11.19km
Adare Woodlands pNHA	000429	11.65km
Skollhill pNHA	001996	11.68km
Glenomra Wood pNHA	001013	12.34km
Castle Lake pNHA	000239	14.19km
Gortacullin Bog pNHA	002401	14.26km
Curraghchase Wood pNHA	000174	14.76km

Given the significant distance of the Tory Hill SAC, Glenomra Wood SAC, Askeaton Fen SAC, Ratty River SAC and Curraghchase Woods SAC from the proposed development site and lack of pathway for any impacts arising from activities on-site, there is no likelihood of significant effects on these SACs from the proposed works.

Curraghchase Woods SAC, located almost 15km from the application boundary has amongst its qualifying interests, Lesser Horseshoe Bat, *Rhinolophus hipposideros*. There is an important breeding and wintering colony located on the period residence in the grounds. The typical foraging distance

for Lesser Horseshoe Bats is believed to be up to 2.5km from a roost site (Bontadina *et al*., 2002) – well outside the potential zone of influence of Curraghchase SAC.

The Lesser Horseshoe Bat has a limited distribution in Ireland and is almost entirely concentrated in six Atlantic coast counties of Cork, Kerry, Limerick, Clare, Galway and Mayo (Roche *et al*. 2015). Ireland and Wales are home to some of the largest remaining populations of the species in Europe. It was once a widespread and abundant species but is currently one of the rarest bats in north-west Europe (Bontadina *et al*., 2008). It declined severely throughout much of its range between the 1950s and the 1980s and became locally extinct in the lowlands of Switzerland (*loc cit*.), and in parts of Britain (Schofield & McAney, 2008). It was thought to have gone extinct in the Netherlands and Luxembourg and is critically endangered in Germany (Hutson *et al.*, 2001). Due to declines in the European population, the Lesser Horseshoe Bat receives the highest level of protection under Irish and European legislation as an *Annex II* species of the EU Habitats Directive. It is the only Annex II bat species in Ireland, and large roosting sites, usually with >100 individuals in summer maternity roosts or >50 individuals in winter hibernation roosts, require the Irish government to designate a Special Area of Conservation (SAC) for its protection (Roche *et al*., 2015).

With particular relevance to this area, the Lesser Horseshoe Bat population in Ireland is fragmented and concern has been raised about a potential 'Limerick gap' in distribution. It was feared that the species could be on the road to local extinction without concerted efforts to protect and enhance roosting opportunities and improve habitat connectivity to link up the remaining colonies (see Roche *et al*. 2015). There are no records of Lesser Horseshoe Bats from the western city environs in Limerick (NBDC). There have been a number of isolated records of Lesser Horseshoe Bats from an undisclosed location in grid square (R5857) in recent years, but there are no published records of roost or regular foraging sites for the species in Limerick city.

It is certain, that the species has been under-recorded. Ecology Ireland has discovered a number of roost sites throughout Limerick, Clare and Cork and confirmed wider distribution of the species than previously known in recent years. The availability of passive detectors that can be deployed at sites for long periods unattended has certainly helped confirm the presence of less common species that could easily be missed by more traditional survey methods. Ecology Ireland has confirmed feeding and roosting sites for Lesser Horseshoe Bats at other sites in Limerick city in recent months (G. Fennessy pers obs.). The emerging evidence confirms that Lesser Horseshoe Bats are occurring in area where they were believed to be absent. The presence of Lesser Horseshoe Bats in an urban area may suggest that the species is somewhat more tolerant of night-time lighting than currently understood. It also indicates that the conservation outlook for the species may be altogether more positive for the species if the population is more widespread and less geographically isolated than was previously known.

The small number of records identified of Lesser Horseshoe Bats in the area were spread across several seasons. There was no regular occurrence in the area and while the finding is of interest it does not indicate that the site is of any special importance for the species. The limited number of records may relate to an individual or small number of individuals commuting through the site or said individuals at the edge of their typical foraging range. The recent confirmation of Lesser Horseshoe Bats

elsewhere in the city (G. Fennessy; confidential location) also provides a possible locus for bats foraging widely in Limerick city.

Tory Hill SAC, Glenomra Wood SAC, Askeaton Fen SAC, Ratty River SAC and Curraghchase Woods SAC will not be considered in any further detail as part of this assessment due to their distance from the development site, the nature and location of the development and the lack of any clear pathway for potential impacts to occur. The Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA will be the only Natura sites considered in further detail.

The qualifying interests and conservation objectives of the designated sites under consideration are summarised in Table 4-3 below.

4.1 Lower River Shannon SAC

The Lower River Shannon SAC lies 0.06km west of the proposed works at Greenpark, Limerick.

This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. The Inner Shannon Estuary – South Shore pNHA lies approximately 0.11km west of the proposed works at Greenpark, Limerick overlaps with section of the Lower Shannon River SAC and The River Shannon and Fergus Estuaries SPA Natura 200 sites (see

Table 4-3 for conservation objectives).

The qualifying interests of this SAC are as follows: Sandbanks which are slightly covered by sea water all the time [1110], Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Reefs [1170], Perennial vegetation of stony banks [1220], Vegetated sea cliffs of the Atlantic and Baltic coasts [1230], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330], Mediterranean salt meadows (*Juncetalia maritimi*) [1410], Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410], Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0], *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029], *Petromyzon marinus* (Sea Lamprey) [1095], *Lampetra planeri* (Brook Lamprey) [1096], *Lampetra fluviatilis* (River Lamprey) [1099], *Salmo salar* (Salmon) [1106], *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] and *Lutra lutra* (Otter) [1355].

4.2 River Shannon and River Fergus Estuaries SPA

The River Shannon and River Fergus Estuaries SPA lies 0.013km west of the proposed works at Greenpark, Limerick. The Fergus Estuary and Inner Shannon – North Shore pNHA lies approximately 0.59km north of the proposed works at Greenpark, Limerick and overlaps with the River Shannon and River Fergus Estuary SPA and as such is of conservation significance for bird species and coastal/wetland habitats.

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats, and this provides important high tide roost areas for the wintering birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Cormorant (*Phalacrocorax carbo*) [A017], Whooper Swan (*Cygnus cygnus*) [A038], Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Wigeon (*Anas penelope*) [A050], Teal (*Anas crecca*) [A052], Pintail (*Anas acuta*) [A054], Shoveler (*Anas clypeata*) [A056], Scaup (*Aythya marila*) [A062], Ringed Plover (*Charadrius hiaticula*) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Lapwing (*Vanellus vanellus*) [A142], Knot (*Calidris canutus*) [A143], Dunlin (*Calidris alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162], Greenshank (*Tringa nebularia*) [A164], Black-headed Gull (*Chroicocephalus ridibundus*) [A179] and Wetland and Waterbirds [A999]

In Table 4-3 below the qualifying and special conservation interests of and known distribution and potential vulnerability of impacts on The Lower River Shannon SAC and the River Shannon and River Fergus SPA from the project in the absence of mitigation are summarised. These tables highlight the features and interests more and less likely to be impacted but for any site with features and interests

that could potentially be affected, full consideration is given to the site and its conservation objectives as part of the subsequent Natura Impact Statement.

Table 4-3 Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA and their Conservation Objectives, Potential impacts of influence of the proposed works.

Lower River Shannon SAC 002165			
Qualifying interest species	**Potential Presence within the Zone of influence**	**Potential impacts**	**Screening rationale**
Sandbanks which are slightly covered by sea water all the time [1110]	The closest example of this habitat is located over 80km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out.
Estuaries [1130]	The closest example of this habitat is located approximately 230m west of the proposed works. Within this SAC Estuaries habitat area was estimated as 24,273ha.	Pollution/release of suspended solids.	Site specific mitigation will be required to ensure no effects occur on this habitat.
Mudflats and sandflats not covered by seawater at low tide [1140]	The closest example of this habitat is located approximately 230m west of the proposed works. Within this SAC Mudflats and sandflats habitat area was estimated as 8,808ha.	Pollution/release of suspended solids.	Site specific mitigation will be required to ensure no effects occur on this habitat.
Coastal lagoons [1150]	The closest example of this habitat is located over 20km away from the study site and therefore there is no likelihood	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out.

	of impact upon this QI.		
Large shallow inlets and bays [1160]	The closest example of this habitat is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Reefs [1170]	The closest example of this habitat is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Perennial vegetation of stony banks [1220]	The closest example of this habitat is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	The closest example of this habitat is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Salicornia and other annuals colonising mud and sand [1310]	The closest example of this habitat is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Atlantic salt meadows (*Glauco-*	The closest example of this habitat is	No potential source-pathway-receptor links to	Screened out

Puccinellietalia maritimae) [1330]	located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	this habitat, therefore no potential impact.	
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	The closest example of this habitat is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	The full distribution of this habitat and its sub types in this site are currently unknown (NPWS August 2012). Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River there is potential for significant effects on this habitat due to the proposed works.	Pollution/release of suspended solids.	Site specific mitigation will be required to ensure no effects occur on this habitat.
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	Distribution of this habitat in this site is currently unknown (NPWS August 2012). Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and	Pollution/release of suspended solids.	Site specific mitigation will be required to ensure no effects occur on this habitat.

	incorporates the tidal reaches of the Ballynaclogh River there is potential for significant effects on this habitat due to the proposed works.		
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	The closest record of this species is located over 30km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	The nearest Freshwater Pearl Mussel catchment lies over 30km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this habitat, therefore no potential impact.	Screened out
Petromyzon marinus (Sea Lamprey) [1095]	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River there is potential for significant effects on	Pollution/release of suspended solids.	Due to the Sea Lamprey being sensitive to water quality and any changes, site specific mitigation is required to ensure that associated water bodies are not impacted by any pollution which may occur from the proposed works.

	this species due to the proposed works.		
Lampetra planeri (Brook Lamprey) [1096]	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River there is potential for significant effects on this species due to the proposed works.	Pollution/release of suspended solids.	Due to Brook Lamprey being sensitive to water quality and any changes, site specific mitigation is required to ensure that associated water bodies are not impacted by any pollution which may occur from the proposed works.
Lampetra fluviatilis (River Lamprey) [1099]	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River there is potential for	Pollution/release of suspended solids.	Due to River Lamprey being sensitive to water quality and any changes, site specific mitigation is required to ensure that the associated water bodies are not impacted by any pollution which may occur from the proposed works.

	significant effects on this species due to the proposed works.		
Salmo salar (Salmon) [1106]	Artificial barriers block salmons' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River there is potential for significant effects on this species due to the proposed works.	Pollution/release of suspended solids.	Due to Salmon being sensitive to water quality and any changes, site specific mitigation is required to ensure that the associated water bodies are not impacted by any pollution which may occur from the proposed works.
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	Regular breeding of this species has not been confirmed in the Ballynaclogh River. The closest record of this species is located over 40km away from the study site and therefore there is no likelihood of impact upon this QI.	No potential source-pathway-receptor links to this species, therefore no potential impact.	Screened out
Lutra lutra (Otter) [1355]	Otter have been recorded along the Ballynaclogh River; however, no spraints, holts or prints were located along the study site). Effects on this species cannot be ruled out.	Pollution/release of suspended solids.	Site specific mitigation is required to ensure no impact on this species occurs during the proposed works.

	Given that the Limerick Dock (IE_SH_060_0900) transitional water body runs parallel to the proposed development and incorporates the tidal reaches of the Ballynaclogh River there is potential for significant effects on this species due to the proposed works.		
River Shannon and River Fergus Estuaries SPA 004077			
Qualifying interest species	**Potential Presence within the Zone of influence**	**Potential impacts**	**Screening rationale**
Cormorant (*Phalacrocorax carbo*) [A017]	The areas surrounding the proposed works are deemed suitable for these species.	Pollution/Disturbance	Pollution: Mitigation measures will be put in place during construction works to prevent any pollution to the area from occurring. Disturbance: Mitigation measures will be put in place in the form of timing of construction (April to September; outside wintering bird months) to avoid disturbance to wintering birds.
Whooper Swan (*Cygnus cygnus*) [A038]			
Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]			
Shelduck (*Tadorna tadorna*) [A048]			
Wigeon (*Anas penelope*) [A050]			
Teal (*Anas crecca*) [A052]			
Pintail *(Anas acuta*) [A054]			
Shoveler *(Anas clypeata*) [A056]			

Scaup (*Aythya marila*) [A062]			
Ringed Plover (*Charadrius hiaticula*) [A137]			
Golden Plover (*Pluvialis apricaria*) [A140]			
Grey Plover (*Pluvialis squatarola*) [A141]			
Lapwing (*Vanellus vanellus*) [A142]			
Knot (*Calidris canutus*) [A143]			
Dunlin (*Calidris alpina*) [A149]			
Black-tailed Godwit (*Limosa limosa*) [A156]			
Bar-tailed Godwit (*Limosa lapponica*) [A157]			
Curlew *(Numenius arquata*) [A160]			
Redshank (*Tringa totanus*) [A162]			
Greenshank (*Tringa nebularia)* [A164]			
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]			
Wetland and Waterbirds [A999]			

4.3 Potential Impact-receptor Pathways: Overview

4.3.1 Hydrological Links

As mentioned previously there is a potential impact-receptor pathway via a hydrological link between the development site and the designated sites, The Lower River Shannon SAC and The River Shannon and River Fergus Estuaries SPA. An open drain to the Ballynaclogh River is located in the north of the study area which runs under the site access road.

Drainage ditches may be cut to intercept surface water where there is a risk of significant water flow into excavations or on to adjoining lands. There will also be a requirement to periodically pump water from excavations. All collected and pumped water will have to be treated prior to discharge. The run-off will be directed through appropriately sized settlement ponds to remove suspended solids. All treated water will then be directed to an existing lagoon (with an estimated capacity of 23,000m^3) to the west of the site. The lagoon was constructed in anticipation of the site being developed and was sized to receive and attenuate the operational surface water drainage.

A new surface water sewer network shall be provided for the proposed development which will be entirely separate from the foul water sewer network. Surface water run-off from roof areas and hardstanding areas are designed to be collected by a gravity pipe network. Surface water will be collected and discharged via a mixture of traditional and sustainable (SuDS) drainage to the existing 1350mm/1500mm diameter surface water sewer. Each unit will have its own independent connection to the surface water sewer network. All SuDS measures are to be implemented with reference to the UK Suds Manual and Limerick City & County Council water services department requirements.

The minimum diameter of the mainline surface water sewers is 225mm and minimum horizontal and vertical separation distances between the proposed drainage and other services are as per the Irish Water Code of Practice.

It is proposed that surface water will discharge via attenuation tanks, a class 1 bypass separator and flow control device prior to discharging to the existing surface water network. The surface water drainage network has been analysed for the risk of flooding for a 1 in 5-year flood event, 1 in 30- year rainfall event and a 1 in 100-year rainfall event by means of simulating such events in the drainage model with no flooding occurring. An increase of 20% in rainfall has been included to account for climate change and 10% for urban creep. Please refer to Appendix D of Punch Consulting Engineers Engineering Report for the development for detailed calculations. This surface water drainage network will ultimately discharge surface water to the existing SuDS lagoon (14.561ha in size) for further attenuation and treatment prior to discharge via the existing outfall to the tidal reaches of the Ballynaclogh River.

All surface water drainage from hard standing areas will ultimately drain to the lagoon via suitable sized class 1 bypass interceptors.

The conservation objectives and qualifying interests of the sites with a potential hydrological link are summarised in Table 4-4 below. Indirect hydrological effects (including cumulative impacts) on these designated sites will be assessed in Section 5 of this report.

There are no hydrological links between the proposed development and the other Nature 2000 sites listed above in Table 4-1.

4.3.2 Disturbance/Displacement

The construction activity will see a localised increase in a potential source of disturbance (noise, vehicular movement, presence of people) within the development site. The Lower River Shannon SAC lies 0.06km west, The River Shannon and River Fergus Estuaries SPA lies 0.13km west, The Inner Shannon Estuary – South Shore pNHA lies 0.12km west and The Fergus Estuary and Inner Shannon – North Shore pNHA which lies 0.59km north of the development site and are designated for the protection of habitats and species.

The conservation objectives of the sites with a potential for disturbance or displacement caused by the construction phase of the works are summarised in Table 4-5 below.

Disturbance to any of the key species of the other Natura 2000 sites is not expected.

4.4 Potential Impact-Receptor Pathways: Summary

The proposed development site has potential hydrological connectivity with two Natura 2000 sites (Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA) and their overlapping pNHA sites, via an open drain to the Ballynaclogh River. Significant effects during the construction phase cannot be discounted without the implementation of best practice construction design measures.

Therefore, it cannot be concluded, that the proposed project, individually or in combination with other plans or projects, will not have a significant effect on Natura 2000 sites, without the consideration and analysis of further information. Therefore Stage 2 NIS (AA) is required.

A Natura Impact Statement (NIS) is presented in **Section 5**, to provide scientific examination of the project to enable An Bord Pleanála to undertake an AA. The NIS will examine potential effects to Natura 2000 sites screened in as part of this Screening for Appropriate Assessment; i.e. Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

In summary, Section 5 of this NIS further considers; (i) potential indirect hydrological impacts in relation to The Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA as a result of the hydrological connection via the Ballynaclogh River.

Table 4-4 Hydrological Links and Conservation Objectives

Natura 2000 Site & Code	Conservation Objectives Affected by Hydrological Links	Minimum Distances
The Lower River	The Lower River Shannon SAC is designated as a Special Area of Conservation (SAC) for a list of different habitats and species. The habitats and species that may be affected by	0.06km over land, 0.06km via watercourses

Natura 2000 Site & Code	Conservation Objectives Affected by Hydrological Links	Minimum Distances
Shannon SAC 002165	hydrological links caused by the proposed works are listed below. Its conservation objectives relate to maintaining the favourable conservation condition of its qualifying interests (after NPWS 2012). **Habitats:** Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140], Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260], Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] **Species:** *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	

Table 4-5 Disturbance/Displacement and Conservation Objectives

Natura 2000 Site & Code	Conservation Objectives Affected by Disturbance/Displacement	Minimum Distances
The Lower River Shannon SAC 002165 & The River Shannon and River Fergus Estuaries SPA 004077	The Lower River Shannon SAC is designated as a Special Area of Conservation (SAC) for a list of different habitats and species. The habitats and species that may be affected by hydrological links caused by the proposed works are listed below. The River Shannon and River Fergus Estuaries SPA is of high ornithological importance. The species that may be affected by disturbance/displacement caused by the proposed works are listed below. **Species:** *Lutra lutra* (Otter) [1355], Cormorant (*Phalacrocorax carbo*) [A017], Whooper Swan (*Cygnus cygnus*) [A038], Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Wigeon (*Anas penelope*) [A050], Teal (*Anas crecca*) [A052], Pintail (*Anas acuta*) [A054], Shoveler (*Anas clypeata*) [A056], Scaup (*Aythya marila*) [A062], Ringed Plover (Charadrius hiaticula) [A137], Golden Plover *(Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Lapwing (*Vanellus vanellus*) [A142], Knot (*Calidris canutus*) [A143], Dunlin (*Calidris alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162], Greenshank (*Tringa nebularia*) [A164],	0.06km over land, 0.06km via watercourses 0.13km over land, 0.13km via watercourses

Natura 2000 Site & Code	Conservation Objectives Affected by Disturbance/Displacement	Minimum Distances
	Black-headed Gull (*Chroicocephalus ridibundus*) [A179] and Wetland and Waterbirds [A999]	

5 Assessment: Natura Impact Statement

As outlined in previous sections there are particular conservation objectives associated with each of qualifying/special conservation interests of the Natura 2000 sites.

In general, the favourable conservation status of a habitat is achieved when:

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

Conservation Objectives of the Lower River Shannon SAC

The details below have been taken from the Conservation Objectives for the Lower River Shannon SAC and can be found at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf. More detail on each of the special conservation interests (SCIs) can be found at the above link. Table 5-1 summarises the Conservation Objectives for each of the SCIs.

Table 5-1 Qualifying Interests of The Lower River Shannon SAC

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
Lower River Shannon SAC 002165	To maintain the favourable conservation condition of Sandbanks [1110] which are slightly covered by sea water all the time in the Lower River Shannon SAC	Habitat disturbance	Occurrence
		Habitat area	Hectares
		Community distribution	Hectares
	To maintain the favourable conservation condition of Estuaries [1130] in the Lower River Shannon SAC	Habitat area	Hectares
		Community distribution	Hectares
		Habitat area	Hectares

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
	To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide [1140] in the Lower River Shannon SAC	Community distribution	Hectares
	To restore the favourable conservation condition of Coastal lagoons [1150] in the Lower River Shannon SAC	Habitat area	Hectares
		Habitat distribution	Occurrence
		Salinity regime	practical salinity units (psu)
		Hydrological regime	Metres
		Barrier: connectivity between lagoon and sea	Permeability
		Water quality: chlorophyll a	µg/L
		Water quality: Molybdate Reactive Phosphorus (MRP)	mg/L
		Water quality: Dissolved Inorganic Nitrogen (DIN)	mg/L
		Depth of macrophyte colonisation	Metres
		Typical plant species	number and m²
		Typical animal species	number
		Negative indicator species	Number and % cover
	To maintain the favourable conservation condition of Large shallow inlets and bays [1160] in the Lower River Shannon SAC	Habitat area	Hectares
		Community distribution	Hectares

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
	To maintain the favourable conservation condition of Reefs [1170] in the Lower River Shannon SAC	Habitat distribution	Occurrence
		Habitat area	Hectares
		Community distribution	Hectares
	To maintain the favourable conservation condition of Perennial vegetation of stony banks [1220] in the Lower River Shannon SAC	Habitat area	Hectares
		Habitat distribution	Occurrence
		Physical structure: functionality and sediment supply	Presence/ absence of physical barriers
		Vegetation structure: zonation	Occurrence
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops
		Vegetation composition: negative indicator species	Percentage cover
	To maintain the favourable conservation condition of Vegetated sea cliffs [1230] in the Lower River Shannon SAC	Habitat length	Kilometres
		Habitat distribution	Occurrence
		Physical structure: functionality and hydrological regime	Occurrence of artificial barriers
		Vegetation structure: zonation	Occurrence
		Vegetation structure: vegetation height	Centimetres
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
		Vegetation composition: negative indicator species	Percentage
		Vegetation composition: bracken and woody species	Percentage
	To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand [1310] in the Lower River Shannon SAC	Habitat area	Hectares
		Habitat distribution	Occurrence
		Physical structure: sediment supply	Presence/absence of physical barriers
		Physical structure: flooding regime	Hectares flooded; frequency
		Physical structure: creeks and pans	Occurrence
		Vegetation structure: zonation	Occurrence
		Vegetation structure: vegetation height	Centimetres
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops
		Vegetation structure: negative indicator species: *Spartina anglica*	Hectares
	To maintain the favourable conservation condition of Atlantic salt meadows	Habitat area	Hectares
		Habitat distribution	Occurrence

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
	(*Glauco-Puccinellietalia maritimae*) [1330] in the Lower River Shannon SAC	Physical structure: sediment supply	Presence/absence of physical barriers
		Physical structure: flooding regime	Hectares flooded; frequency
		Physical structure: creeks and pans	Occurrence
		Vegetation structure: zonation	Occurrence
		Vegetation structure: vegetation height	Centimetres
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stop
		Vegetation structure: negative indicator species: Spartina anglica	Hectares
	To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) [1410] in the Lower River Shannon SAC	Habitat area	Hectares
		Habitat distribution	Occurrence
		Physical structure: sediment supply	Presence/absence of physical barriers
		Physical structure: flooding regime	Hectares flooded; frequency
		Physical structure: creeks and pans	Occurrence
		Vegetation structure: zonation	Occurrence

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
		Vegetation structure: vegetation height	Centimetres
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stop
		Vegetation structure: negative indicator species: Spartina anglica	Hectares
		Vegetation structure: vegetation height	Centimetres
		Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops
		Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stop
	To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho – Batrachion* vegetation [3260] in the Lower River Shannon SAC	Habitat distribution	Occurrence
		Habitat area	Kilometres
		Hydrological regime: river flow	
		Hydrological regime: tidal influence	
		Substratum composition: particle size range	Millimetres
		Water quality: nutrients	Milligrams per litre
		Vegetation	Occurrence

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
		composition: typical species	
		Floodplain connectivity: area	Hectares
	To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt laden soils (*Molinion caeruleae*) [6410] in the Lower River Shannon SAC	Habitat distribution	Occurrence
		Habitat area	Hectares
		Vegetation structure: broadleaf herb: grass ratio	Percentage
		Vegetation structure: sward height	Percentage
		Vegetation composition: typical species	Number
		Vegetation composition: notable species	Number
		Vegetation composition: negative indicator species	Percentage
		Vegetation composition: negative indicator moss species	Percentage
		Vegetation structure: woody species and bracken (Pteridium aquilinum)	Percentage
		Physical structure: bare ground	Percentage
	To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] in the Lower River Shannon SAC	Habitat distribution	Occurrence
		Habitat area	Hectares
		Woodland size	Hectares
		Woodland structure: cover and height	Percentage and metres
		Woodland structure: community diversity and extent	Hectares
		Woodland structure: natural regeneration	Seedling: sapling: pole ratio

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
		Hydrological regime: flooding depth/height of water table	Metres
		Woodland structure: dead wood	m^3 per hectare; number per hectare
		Woodland structure: veteran trees	Number per hectare
		Woodland structure: indicators of local distinctiveness	Occurrence
		Vegetation composition: native tree cover	Percentage
		Vegetation composition: typical species	Occurrence
		Vegetation composition: negative indicator species	Occurrence
	To restore the favourable conservation condition of Sea lamprey (*Petromyzon marinus)* [1095] in the Lower River Shannon SAC	Distribution: extent of anadromy	% of river accessible
		Population structure of juveniles	Number of age/size groups
		Juvenile density in fine sediment	Juveniles/m2
		Extent and distribution of spawning habitat	m2 and occurrence
		Availability of juvenile	Number of positive sites

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
		habitat	in 3rd order channels (and greater), downstream of spawning areas
	To restore the favourable conservation condition of Brook lamprey (*Lampetra planeri*) [1096] in the Lower River Shannon SAC	Distribution	% of river accessible
		Population structure of juveniles	Number of age/size groups
		Juvenile density in fine sediment	Juveniles/m2
		Extent and distribution of spawning habitat	m2 and occurrence
		Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas
	To restore the favourable conservation condition of River lamprey (*Lampetra fluviatillis)* [1099] in the Lower River Shannon SAC	Distribution: extent of anadromy	% of river accessible
		Population structure of juveniles	Number of age/size groups
		Juvenile density in fine sediment	Juveniles/m2
		Extent and distribution of spawning habitat	m2 and occurrence
		Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas
	To restore the favourable conservation condition of Salmon (*Salmo salar*) [1106] (only in fresh water) in the Lower River Shannon SAC	Distribution: extent of anadromy	% of river accessible
		Adult spawning fish	Number
		Salmon fry abundance	Number of fry/5 minutes electrofishing
		Out mitigating smolt abundance	Number

Site	Qualifying Interest (Conservation Objectives, NPWS, 7th August 2012, Version 1.0)	Attribute	Measure
		Number and distribution of redds	Number and occurrence
		Water quality	EPA Q value
	To maintain the favourable conservation condition of Bottlenose Dolphin (*Tursiops truncatus*) [1355] in the Lower River Shannon SAC	Access to suitable habitat	Number of artificial barriers
		Habitat use: critical areas	Location and hectares
		Disturbance	Level of impact
	To restore the favourable conservation condition of Otter (*Lutra lutra*) [1355] in the Lower River Shannon SAC	Distribution	Percentage positive survey sites
		Extent of terrestrial habitat	Hectares
		Extent of marine habitat	Hectares
		Extent of freshwater (river) habitat	Kilometres
		Extent of freshwater (lake/lagoon) habitat	Hectares
		Couching sites and holts	Number
		Fish biomass available	Kilograms
		Barriers to connectivity	Number

Conservation Objectives of The River Shannon and River Fergus Estuaries SPA

The details below have been taken from the Conservation Objectives for the River Shannon and River Fergus Estuaries SPA and can be found at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf. More detail on each of the special conservation interests (SCIs) can be found at the above link. The following Table summarises the Conservation Objectives for each of the SCIs.

Table 5-2 Qualifying Interests of The River Shannon & Fergus Estuaries SPA

Site	Qualifying Interest (Conservation Objectives, NPWS, 17th September 2012)	Attribute	Measure
River Shannon and River Fergus Estuaries SPA 004077	To maintain the favourable conservation condition of Cormorant (*Phalacrocorax carbo*) [A017] in the River Shannon and River Fergus Estuaries SPA	Breeding population abundance: apparently occupied nests (AONs)	Number
		Productivity rate	Mean number
		Distribution: breeding colonies	Number; location; area (hectares)
		Prey biomass available	Kilogrammes
		Barriers to connectivity	Number; location; shape; area (hectares)
		Disturbance at the breeding site	Level of impact
		Population trend	Percentage change
		Distribution	Range, timing and intensity of use of areas

Site	Qualifying Interest (Conservation Objectives, NPWS, 17th September 2012)	Attribute	Measure
	To maintain the favourable conservation condition of; Whooper Swan (*Cygnus cygnus*) [A038] , Light-bellied Brent Goose (*Branta bernicla hrota*) [A046], Shelduck (*Tadorna tadorna*) [A048], Wigeon (*Anas penelope*) [A050], Teal (*Anas crecca*) [A052], Pintail (*Anas acuta*) [A054], Shoveler (*Anas clypeata*) [A056], Scaup (*Aythya marila*) [A062], Ringed Plover (*Charadrius hiaticula*) [A137], Golden Plover (*Pluvialis apricaria*) [A140], Grey Plover (*Pluvialis squatarola*) [A141], Lapwing (*Vanellus vanellus*) [A142], Knot (*Calidris canutus*) [A143], Dunlin (*Calidris alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156], Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162], Greenshank (*Tringa nebularia*) [A164] and Black-headed Gull (*Chroicocephalus ridibundus*) [A179] in the River Shannon and River Fergus Estuaries SPA	Population trend Distribution	Percentage change Range, timing and intensity of use of areas
	Wetland and Waterbirds [A999]	Wetland habitat area	Hectares

5.1 Elements of the Project that may Potentially Impact on Qualifying Interests of the Natura 2000 Site

5.1.1 Indirect Habitat Loss or Deterioration

Indirect habitat loss or deterioration of designated sites within the surrounding area could occur from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination. This requires connectivity between the site and the designated site in question through watercourses and/or drainage ditches. In this case, the proposed development site is connected via an open drain to the Ballynaclogh River. The ground conditions at the site mean that the main pathway for contamination is via surface water pathways which are particularly important for phosphate export which is the key limiting nutrient in transitional water bodies. The drainage network onsite connects the proposed development site directly to the Ballynaclogh River which forms part of the Lower River Shannon SAC and the River Shannon, the River Fergus Estuaries SPA. There is therefore a direct hydrological connection between the SHD application site and these designated sites. It should be noted that the relevant designated sites are located less than 1km from the proposed works.

The qualifying and special conservation interests and conservation objectives of The Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA are listed above in Table 5-1 and Table 5-2.

5.1.2 Cumulative or In-combination Effects

In order to fully assess the potential impact of the proposed development on Natura 2000 sites, the project must be assessed alone or in combination with existing activities and proposed plans for the region. Myplan.ie and Limerick City and County Development Plan 2022-2028 were consulted in order to determine if there were any other plans or projects in the area which could result in cumulative impacts. These plans and projects are considered further in this respect in Table 5-3 below.

In general, the projects and plans are subject to their own assessments and planning processes. Many of the applications reviewed were for other developments that will need to ensure that they will not in themselves or in combination with other plans or projects have the potential to adversely impact upon the nearby designated sites. Potential cumulative effects in relation to other developments include construction related surface-water run-off, where qualifying interests associated with Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA could be subject to cumulative impact through hydrological or water quality impacts such as increased siltation, nutrient release and contaminated run-off arising from other developments. All of these projects have been considered on their own and in relation to the potential for any cumulative or in combination impacts arising from any combination of these projects proceeding in the future.

Taking the above into consideration, along with the proposed environmental management and controls integrated into the project design here and for other projects planned or proposed in the area cumulative and in-combination effects relating to other developments are not considered to be relevant in this case.

Table 5-3 Planning Applications in the vicinity of the proposed works.

Name of Planning Authority	Ref. Number	Address	Description of proposed development	Hyperlink to application on Planning Authority website
An Bord Pleanala	304303	Ted Russel Dock, Dock Road/James Casey Walk, Limerick	Port enhancement works involving the removal and reorganisation of buildings and features adjacent to the 'Clock Tower' and the mooring of a floating vessel for the use of commercial data storage; construction of; a new industrial building comprising workshop with ancillary storage and office space; and associated compound comprising associated power generators and infrastructure.	https://www.pleanala.ie/en-ie/case/304303
LCCC/ An Bord Pleanála	171190 Pl91.302015	Greenpark, South Circular Rd., Limerick	Permitted development will consist of the construction of 11 detached houses and 20 semi-detached houses and ancillary development on a site area of 1.6 hectares at Greenpark, Co. Limerick.	https://www.pleanala.ie/en-ie/case/302015
Limerick City & County Council	211222	Greenpark, Limerick.	A planning application has recently been made by the current Applicant for a proposed Nursing Home development on an adjoining part of the former racecourse lands. The proposed nursing home will be accessed via Log na gCapall. The development will be 4 storeys in height with a total gross floor area of c.5,237 sq m, consisting of 123 no. rooms, comprising 126 no. bedspaces (120 no. single rooms and 3 no. double rooms) and ancillary facilities, including 777 sq m of day space. The development will also consist of soft and hard landscaping. The application was accompanied by an EcIA and NIS prepared by Ecology Ireland Ltd.	
Limerick City and County Council	20580	Dock Road, Limerick	Construction of a single storey Warehouse/Distribution Centre and staff carpark on a derelict site, utilising existing entry access off Dock Road and providing new entry/exit access via Ashbourne Business Park service road and all ancillary site works.	http://eplan.limerick.ie/AppFileRefDetails/20580/0

Name of Planning Authority	Ref. Number	Address	Description of proposed development	Hyperlink to application on Planning Authority website
Limerick City and County Council	21239	Unit 1 Ashbourne Business Park, Dock Road, Limerick	Change of use from warehouse/light industrial to a training centre, elevational changes and the rearrangement of internal space including extending the first-floor mezzanine to provide additional training rooms, office space and ancillary accommodation.	http://eplan.limerick.ie/AppFileRefDetails/21239/0
Limerick City and County Council	20628	Dock Road, Limerick	Construction of an extension to the north-east side of the existing raw material store building, the recladding of existing asbestos cladding of this building with plastisol coated metal cladding and associated site works.	http://eplan.limerick.ie/AppFileRefDetails/20628/0
Limerick City and County Council	20687	Dock Road, Limerick	Construction of an extension to the north-east side of the existing raw material store building, the recladding of existing asbestos cladding of this building with plastisol coated metal cladding and associated site works (this site is a Seveso Site to which the Major Accident Regulations apply).	http://eplan.limerick.ie/AppFileRefDetails/20687/0
Limerick City and County Council	20723	Dock Road, Limerick	Development on a brownfield, light industrial zoned site at Dock Road, Limerick. Retention permission is sought for 20 no. containers on site (no.'s 1-20) and the use of such containers for self-storage purposes, and the provision of boundary fencing and an electric gate controlling access into the site. Planning permission is sought for 18 no. containers on site (no.'s 21-39) and the use of such containers for self-storage purposes, 8 no. on site car parking spaces, completion of boundary fencing and provision of signage. Access to the site is via a right of way which utilises the existing commercial site access that served the former Heiton Buckley Providers operation on site.	http://eplan.limerick.ie/AppFileRefDetails/20723/0

Name of Planning Authority	Ref. Number	Address	Description of proposed development	Hyperlink to application on Planning Authority website
Limerick City and County Council	208007	Atlas Avenue & Courtbrack Avenue, Dock Road, Limerick	Upgrading the junctions of Atlas Avenue and Courtbrack Avenue with the Dock Road, Limerick. The proposed development will consist of i) upgrade of traffic signals and public lighting at both junctions, including synchronisation of signals to improve the efficiency of the two junctions; ii) dedicated cycle facilities will be provided on the Dock Road and pedestrian facilities will be improved. Crossings for cyclists and pedestrians will be incorporated into the signalisation of each junction; iii) access to private lands on the northern side of the Dock Road will be closed and the rights of way at these accesses extinguished. Replacement accesses will be provided on to the industrial estate road to the north of the sites; iv) parking bays on Dock Road between Courtbrack Avenue and Atlas Avenue will be removed; v) the carriageway and footways on Atlas Avenue will be widened; vi) the footway on the southern side of the Dock Road will be relocated to provide space for a cycleway and widened carriageway. The boundary wall between Dock Road and 'The Orchards' residential estate will be removed and replaced with a similar wall at the outside edge of the proposed footway. Existing trees will be removed/cut-back as required for the construction of the footway and replacement wall. A line of trees will be planted on the south side of the replacement wall; vii) demolition of the existing Retail Unit on the western side of Atlas Avenue to facilitate the widening of Atlas Avenue; viii) ancillary works for pavement, drainage, utilities and boundary treatment.	http://eplan.limerick.ie/AppFileRefDetails/208007/0

5.2 Mitigation Measures Relevant to the Protection of the Natura 2000 Site

A detailed CEMP has been prepared for this project, detailing the environmental controls and commitments which will apply (GDG 2021). This CEMP provides details of the working hours, operation and management of the construction compound etc. These environmental controls have been informed by the sensitivity of the adjoining riparian habitats and downstream designated sites. A suitably experienced and qualified Ecological Clerk of Works (ECoW) will be appointed to ensure that the environmental control measures are fully and properly implemented. The CEMP also includes the detailed commitments in relation to how the temporary working compound will operate and how run-off and pollution control will be integral to site management.

5.3 CEMP & Aquatic Habitats

As outlined above, particular and detailed commitments to minimise the risk of environmental disruption or damage arising from the development is contained in the CEMP (GDG 2021). For instance, works closer to the river will be carried out according to detailed environmental controls presented below.

5.3.1 Management of suspended solids in run-off

Prior to the commencement of topsoil stripping and earthworks operations, the following site-specific surface water management measures will be put in place:

1. Where possible, significant earthworks operations should be limited to the summer months.
2. Silt fencing will be installed around the perimeter of the site. The location of the silt fencing will be determined in the construction stage CEMP and will be subject to a detailed assessment of the area or phase to be developed. The purpose of the silt fencing is to prevent silt laden water leaving the site and entering neighbouring land with the potential to impact nearby watercourses. A typical silt fence detail is shown below in Plate 5.1. It will consist of a double layer of geotextile membrane fixed to wooden stakes approximately 600mm high. The membrane will be anchored into the ground to form a continuous barrier to silt laden water from the works site. Silt fences will be monitored via a silt inspection log (to be maintained by the Environmental Manager/ECoW) and periodically maintained during the construction period. Typical maintenance will consist of repairs to damaged sections of membrane and removal of a build-up of silt on the upslope side of the fence. Daily silt fence inspections are recommended as part of their operation ensuring that any necessary repairs can be expedited.

Plate 5.1 Silt Fencing (www.geosyn.co.uk)

3. Drainage ditches will be installed to intercept surface water where there is a risk of significant water flow into excavations or on to adjoining lands. There will also be a requirement to periodically pump water from excavations. All collected and pumped water will have to be treated prior to discharge. The run-off will be directed through appropriately sized settlement ponds to remove suspended solids. All treated water will then be directed to an existing constructed wetland lagoon to the west of the site. The constructed wetland was designed in anticipation of the site being developed and was sized to receive and attenuate the operational surface water drainage. Discharge from the constructed wetland to the Ballynaclogh River is controlled by a penstock. The operational flow rates will be much greater, due to the increase in impermeable area. The constructed wetland will therefore be capable of dealing with runoff from the unpaved site during construction.
4. Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.
5. Site personnel will be trained in the importance of preventing pollution and the mitigation measures described here to ensure same.
6. The Environmental Manager or ECoW will be responsible for the implementation of these measures. They will be inspected on at least a daily basis for the duration of the works, and a record of these inspections will be maintained.
7. Any temporary storage of soil, hardcore, crushed concrete or similar material will be stored 50m from any surface water drains. All temporary storage areas should also have surface run-off controls in place to prevent migration of possible materials. There can be no direct pumping of silty water from the works directly to any watercourse. All water from excavations must be treated by infiltration over lands or via settlement areas, silt busters etc.

5.3.2 Flooding

The site is protected from flooding by existing embankments along the Ballynaclogh River and River Shannon. The risk of flooding during the construction period is therefore limited to an embankment breach scenario and then only during the bulk earthworks operations. Once the earthworks are complete, the entire SHD site will be above the breach flood levels. An embankment breach is a catastrophic scenario with potential to cause widespread flooding, pollution and risk to life in the vicinity. The likelihood of flooding during the earthworks operations is extremely low. The following measures will be required:

1. Stockpiles of soil shall be kept at the highest level possible within the site.
2. Silt fencing and settlement ponds shall be placed at the highest level possible within the site. Silt fences shall be inspected as part of the daily inspection regime. Trapped silt shall be removed from silt fencing at regular intervals.
3. Earthworks shall be left exposed for the minimum time possible. Earthworks formations shall be protected by a layer of imported granular fill.
4. Landscaping and seeding of the perimeter embankments and retaining structures in accordance with the Landscaping Plan shall be carried out as early as possible.
5. An Emergency Response plan shall be developed for the site and shall consider the following:
    a. Flood forecasting shall be used to determine the probability of the site being flooded.
    b. Emergency evacuation routes will be included in the plan to ensure that flooding does not threaten the safety of construction personnel and/or residents.
    c. Site compounds, fuel storage areas, generators and the like shall be sited as high as possible on the site.

5.3.3 Control of cement run-off

The washing out of concrete delivery vehicles is a potential source of pollution and shall be carried out in in designated wash out areas only. Wash-out areas on site will be located greater than 50m from any natural watercourse and properly designed with an impermeable liner to contain all cement laden water. No wash-out of ready-mix concrete vehicles shall be located within 10 metres of any temporary or permanent drainage features. Signage shall be erected to clearly identify the wash-out areas. Sufficient wash-out areas shall be provided to cater for all vehicles at peak delivery times.

On-site batching of concrete is not envisaged, but ready to use mortar silos are often used for housing developments. These systems involve the delivery and storage of dry cement and aggregates in silos, water is added at the point of delivery to make mortar or plaster. The following controls shall be put in place for the on-site batching of concrete, mortar and render:

- The plant shall be maintained in good condition.
- Delivery of cement shall be means of a sealed system to prevent escape of cement.
- The plant shall be situated on a paved area at least 20m from any temporary or permanent drainage features.
- Emergency procedures shall be in place to deal with accidental spillages of cement or mortar.

5.3.4 Accidental Spills and Leaks

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks may be kept in the material storage area in suitable containers and will be stored on appropriately bunded spill pallets as required. Any fuel and oil stored onsite shall be stored on bunded spill pallets approved under BS EN 1992-3:2006). All bunds will be impermeable and capable of retaining a volume of equal to or greater than 1.1 times (>110%) capacity of the containers stored on them. In the event of a spillage, excess oil or fuel will be collected in the bund.

Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will be undertaken offsite where possible. Where this is not possible, filling and maintenance will take place in a designated material storage compound, which is located at least 10 metres from any temporary or permanent drainage features. Spill protection equipment such as absorbent mats, socks and sand will be available in clearly marked bins/silos and in construction vehicles to be used in the event of an accidental release during refuelling. Training will be given to site workers in how to manage a spill event.

The following mitigation measures will be taken at the construction site to prevent any spillages to ground of fuels during machinery activities and prevent any resulting soil and/or groundwater quality impacts:

- Refuelling will be undertaken off site where possible.
- Where mobile fuel bowsers are used the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.
    - Any pump or valve will be fitted with a lock and will be secured when not in use.
    - All bowsers to carry a spill kit and operatives must have spill response training; and
    - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.
    - Weekly checks of spill kits will be carried out to ensure they are sufficiently stocked.

5.3.5 Monitoring

Daily checks will be carried out and recorded in a Surface Water Management Log to ensure surface water drains are not blocked by silt, or other items, and that all storage is located the required distance from surface water receptors. A daily log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

5.4 Environmental Control Measures for Habitats and Flora

- No removal of habitats or movement of construction machinery will occur outside of the development works area/footprint during the construction phase, where the works area/footprint will be clearly marked for associated site staff.

- Construction works will be carried out according to standard environmental controls and according to the commitments provided in the CEMP (e.g. dust suppression, run-off control; see CIRIA 2001 & 2010).

- Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will be undertaken offsite where possible. Where this is not possible, filling and maintenance will take place in a designated material storage compound, which is located at least 10 metres from any temporary or permanent drainage features. Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release.

- Construction works within the proposed works areas can potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material. In addition to lands within the proposed works areas, there is an identified risk of invasive plant species being spread onto neighbouring lands and onto public roads and other locations. Construction works could therefore result in the spread of invasive plant species both in-situ and ex-situ. The following measures are proposed to prevent the inadvertent spread of invasive plant species;

(i) The Contractor's will prepare an Invasive Alien Species (IAS) Management Plan for the works.

(ii) Prior to the development works and landscaping activity begins a survey by an appropriately experienced ecologist will be carried out to establish the full extents of the invasive plant species within the proposed development site boundary;

(iii) In accordance with the TII guidance this survey will produce accurate 1:5,000 scale mapping for the precise location of invasive species. The pre-construction surveys will be undertaken by suitable ecologists with competence in identifying the species concerned having regard to any seasonal constraint.

(iv) Areas of invasive species will be fenced off and signage installed where no works will take place within this area until such time as they can be eradicated/managed;

(v) The invasive species will be appropriately managed (aiming for eradication) prior to any vegetation clearance works occurring where these species were identified.

- Flora protection order species and Red listed plant species are known to occur in the proposed development area e.g. opposite-leaved pondweed (*Groenlandia densa*), triangular clubrush (*Schoenoplectus triqueter*), Least Bur-reed (*Sparganium natans*), Penny Royal (*Mentha pulegium*), Meadow Barley (*Hordeum secalinum*) and Autumn Crocus (*Colchicum autumnale*), Greater knapweed (*Centaurea scabiosa*). Prior to construction the qualified ecologist will check suitable habitat within the development footprint for these species.

- If any protected/Red listed species/species of ecological interest are found efforts to avoid impact will be implemented. If this is not possible the species will be translocated to a more suitable location to be implemented by the qualified ecologist.

- The area of species rich Dry calcareous and neutral grassland (GS1) located in the east of the proposed development site supports an abundance of Common spotted orchid and a species

rich calcareous plant community. Prior to site clearance and under the supervision of a qualified ecologist this area shall be marked out, the topsoil in the area shall be removed carefully, kept intact and watered during the construction period to be reinstated and used in landscaping of the green areas or transferred to a suitable location to conserve the seedbank.

5.5 Environmental Control Measures for Fauna

- All vegetation clearance will be completed outside of the bird breeding season (1st March to 31st August). Any vegetation clearance required during the bird breeding season will only proceed following checks of the areas in question by a suitably qualified ecologist. All clearance works during the bird breeding season will be subject to supervision by the ECoW who will have 'stop works' authority in the event that there is any perceived risk to nesting birds.

- Construction operations will take place during the hours of daylight for the most part to minimise disturbances to roosting birds or any active crepuscular/nocturnal bird species.

- A minimum of 20 bird nest boxes will be erected on lands in the ownership of the applicant at Greenpark. These will include a Barn Owl box, a selection of woodcrete or recycled plastic nest boxes and 5 Swift bricks which will be integrated into the buildings on-site. The ECoW will advise and supervise the selection and installation of these nest boxes. The bird nest boxes will be monitored and maintained annually by a suitably qualified person for the first five years post construction.

- Construction operations will take place during the hours of daylight to minimise disturbances to nocturnal mammal species. Prevention of damaging run-off to watercourses will be effective in minimising potential adverse impacts on Otters that occur widely in the hinterland of the proposed development.

- Mammal gates, or suitable opes of adequate size (200mm x 200mm recommended) will be installed at intervals around the construction compound, if the temporary fencing specified presents a barrier to passage of mammals through the construction site. The ECoW will supervise the installation of gates/opes as required.

- Appropriate lighting will be provided as necessary at construction compounds. Where possible all light fittings will be LED, have asymmetrical projection i.e. directional, and with colour temperature of 2700K (warm spectrum preferred by bats). The radiation will be above 500nm to avoid the blue or UV light, most disturbing to bats.

- A total of 20 bat boxes (woodcrete or similar) will be erected, during the construction period, under the supervision of a suitably qualified ecologist or ECoW to increase the available roosts in the area and to enhance local biodiversity. The boxes will be erected on lands in the ownership of the applicant. The location for the bat boxes will be selected by a suitably qualified ecologist and erected under the supervision of the ECoW. The bat boxes will be monitored and maintained annually by a suitably qualified person for the first five years post construction.

5.5.1 Mitigation of potential disturbance/displacement impacts

All construction activity will be confined to within the site boundary, low noise rated machinery and equipment will be selected.

Compressors and generators will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers to prevent further disturbance to species.

Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen.

To mitigate the potential negative impact of lighting on the surrounding habitats, design mitigation will ensure lighting will be minimised during both the construction and operational stages as follows;

- Only be on when needed;
- Only light the area that is required;
- To be switched off at night (exception of low level switchable safety lighting;
- Be no brighter than necessary;
- Minimize blue light emissions;
- Be fully shielded (pointing downward at a 45 degree angle).

The lighting will be as per the following relevant guidelines and standards:

- Bats & Lighting Guidance Notes for Planners, engineers, architects and developers (Bat conservation Ireland, December 2010);

5.5.2 Likely Success of the Mitigation Measures

A suitably qualified ECoW will monitor and supervise the implementation of the environmental protection measures throughout the construction phase.

The mitigation measures have been developed in accordance with current policy, regulations and guidelines as follows;

- Construction and Demolition Waste Management – a Handbook for Contractors and Site Managers published by FAS and the Construction Industry Federation 2002
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects' Department of the Environment, Heritage and Local Government, 2006 (SPGWMP)
- Environmental Good Practice on Site, third edition C692, CIRIA 2010
- Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors, C532, CIRIA 2001
- Irish Water's Code of Practice for Waste Water Infrastructure – A Design and Construction Guide for Developers (Revision 1) December 2017.

- The Planning System and Flood Risk Management Guidelines for Planning Authorities OPW 2009

5.5.3 Timescale for the Implementation of Mitigation Measures

Construction related mitigation measures will be implemented prior to and/or in-tandem with the relevant works being carried out.

5.6 Conclusion

Having taken into consideration the details of the proposed project and the construction mitigation measures proposed in the CEMP (and CWMP & OWMP) and in the EIAR it is concluded that this development would not give rise to any significant effects to the designated sites. The construction and operation of the proposed development will not impact on the conservation objectives of features of interest of Natura 2000 sites.

This report presents a Natura Impact Statement for the Proposed Development, outlining the information required for the competent authority to screen for appropriate assessment and to determine whether or not the Proposed Development, either alone or in combination with other plans and projects, in view of best scientific knowledge, is likely to have a significant effect on any European or Natura 2000 site.

It can be objectively concluded that no significant effects arising from the proposed development are likely to occur in relation to the Natura 2000 sites (i.e. The Lower River Shannon SAC and The River Shannon and River Fergus Estuaries SPA) or indeed any other Natura 2000 site in the wider hinterland.

5.7 Appropriate Assessment Report

Assessment of the Effects of the Project or Plan on the Integrity of the Natura 2000 Site	
Describe the elements of the project or plan (alone or in combination with other projects or plans) that are likely to give rise to significant effects on the site (from screening assessment)	Elements of the proposed development that may result in potential impacts on The Lower River Shannon SAC and The River Shannon and River Fergus Estuaries SPA in the absence of appropriate environmental protection measures include; • potential construction/operational phase surface-water run-off/discharge impacts., • potential disturbance/displacement impacts on qualifying interests species e.g. Otter, wintering waterbirds. Mitigation measures are required as outlined in Section 5 and in the accompanying CEMP, CWMO & OWMP (GD GEO 2021).
Set out the Conservation objectives of the site	The conservation objectives and qualifying interests of the relevant Natura 2000 sites are outlined in Table 5-1 and Table 5-2 above.
Describe how the project or plan will affect key species and key habitats. Acknowledge uncertainties and any gaps in information.	With the implementation of the mitigation measures specified in Section 5, no indirect habitat loss or deterioration of the SAC or SPA in relation to silt-laden or contaminated surface-water run-off (or operational phase) discharge arising from the proposed development is deemed likely in this case. With the implementation of mitigation for potential disturbance/displacement from lighting and noise arising from the proposed development it is deemed likely in this case that there will be no significant adverse impacts on qualifying species from disturbance displacement.
Describe how the integrity of the site (determined by structure and function and conservation objectives) are likely to be affected by the project and plan (e.g. loss of habitat, disturbance, disruption, chemical changes, hydrological changes and geological changes *etc*.). Acknowledge uncertainties and any gaps in information.	As above.
Describe what mitigation measures are to be introduced to avoid, reduce or remedy the adverse effects on the integrity of the site. Acknowledge uncertainties and any gaps in information.	Mitigation measures will be integrated as part of the proposed development regarding environmental protection of the nearby Lower River Shannon SAC and The River Shannon and River Fergus Estuaries SPA in relation to potential surface-water run-off and discharge, waste-water discharge and disturbance displacement impacts that are summarised in Section 5 above and provided in

	more detail in the CEMP that accompanies the planning application.
Results of Consultation	
Name of agency or body consulted	**Summary of response**
N/A	N/A

6 References

Department of Environment, Heritage & Local Government (DoEHLG). 2009. Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. DoEHLG, Dublin.

European Commission. 2001. Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – European Commission Methodical Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC. European Commission DG Environment, Oxford UK.

Environmental Protection Agency (EPA). 2013. Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioner's Manual. EPA STRIVE Programme 2007–2013; Report Series No. 106. EPA, Wexford.

Kelly, J., O' Flynn, C., and Maguire, C. 2013. Risk Analysis and Prioritisation for Invasive and Non-Native Species in Ireland and Northern Ireland. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland.

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NRA (National Roads Authority). 2010. The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1. December 2010.