Natura Impact Statement

Proposed Residential Development

Rathmullan Road,

Drogheda,

Co. Meath

September 2025

TABLE OF CONTENTS

APPENDIX

DOCUMENT CONTROL

Project Title:	Natura Impact Statement for Proposed Residential Development
Report Ref.:	53363
Status:	Final
Client:	Earlsfort Developments Drogheda Limited
Site Details:	Rathmullan Road, Drogheda, Co. Meath
Issued By:	Verde Environmental Consultants Ltd

Document Production / Approval Record				
	Name	**Signature**	**Date**	**Position**
Created By	Pat Doherty		16/06/2025	Senior Ecologist
Created by	Jeff Hean		01/07/2025	Principal Ecologist
Updated by	Jeff Hean		20/08/2025 & 01/09/2025	Principal Ecologist
Reviewed by	Megan Tallon		01/07/2025 & 09/07/2025	Senior Environmental Consultant
Approved by	Kevin Cleary		02 & 09/07/2025, 28/08/2025 & 01/09/2025	Operations Director

LIMITATIONS

This report constitutes a Natura Impact Statement (NIS) assessing the impact of the Proposed Development on the above-referenced site. Best practice was followed throughout its preparation and within the limitations stated, works were undertaken according to budgetary considerations. This report is the property of Verde Environmental Consultants Limited and cannot be used, copied or given to any third party without the explicit prior approval or agreement of Verde Environmental Consultants Limited.

This report represents an assessment of the site and was performed in accordance with generally accepted standards regarding environmental assessments. Verde makes no other representations whatsoever, including those concerning the legal significance of its findings or as to other legal matters touched on in this report, including, but not limited to ownership of any property or the application of any law to the facts set forth herein.

1.0 INTRODUCTION

Verde Environmental Consultants, (VEC) was commissioned by Earlsfort Developments Drogheda Limited to undertake a Natura Impact Statement (NIS) for a proposed Large-scale Residential Development on a green field site at Rathmullan, Drogheda, Co. Meath (see Figure 1.1 for the site location and Figure 1.2 for the Proposed Development layout).

In accordance with Article 6(3) of the Habitats Directive, as transposed into Irish law by Regulation 42 and Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2025 (i.e. the "Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) (i.e. the "Planning and Development Act"), a Screening Report for Appropriate Assessment (AA) was prepared to examine whether it could or could not be ruled out, on the basis of objective information, in view of best scientific knowledge and in view of the conservation objectives of the site, that the Proposed Development, either individually or in combination with other plans or projects, is likely to have a significant effect on any European Sites. The Screening Report for Appropriate Assessment concluded, in view of best scientific knowledge and in view of the conservation objectives of the European Sites occurring within the zone of influence of the Proposed Development, that, absent the use of appropriate mitigation measures, it could not be ruled out at the screening stage that the Proposed Development would not result in significant negative effects to five European Sites. These European Sites are the:

- River Boyne and River Blackwater SAC (002299)
- Boyne Coast and Estuary SAC (001957)
- River Boyne and River Blackwater SPA (004232)
- Boyne Estuary SPA (004080)
- North-West Irish Sea SPA (004236)
- Boyne River Islands pNHA
- Boyne Coast and Estuary pNHA

The conclusion of the Screening Report was informed by a highly precautionary approach and adopted a worst-case scenario. Such an approach was adopted to ensure consistency with the low threshold for triggering likely significant effects as determined in both European and Irish jurisprudence and s.177U of the Planning and Development Act. On the basis of that conclusion, it was determined that Appropriate Assessment ("AA") for the purposes of the Habitats Directive was required in order to assess the implications of the Proposed Development for the above-listed European Sites. In accordance with s.177T of the Planning and Development Act, this Natura Impact Statement ("NIS") assessing the Proposed Development has been prepared for the consideration of the planning authority in order to assist and inform Meath County Council such as to enable its independent conduct of its AA. This NIS provides an examination, analysis and evaluation of the potential implications of the Proposed Development, both individually and in combination with other plans and projects, in view of best scientific knowledge and the conservation objectives of the European Sites concerned. It takes into account protective mitigation measures forming part of that project aimed at avoiding or reducing any direct adverse effects for the site, in order to ensure that it does not adversely affect the integrity of those sites identified as being potentially at risk of significant effects. Finally, it provides complete, precise and definitive

findings, which are capable of removing all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned.

1.1 Screening Determination

The Screening for Appropriate Assessment assessed the potential for the Proposed Development to result in likely significant effects to the European Sites that are located within the zone of influence of the Proposed Development site. The Screening Report concluded that the five European Sites listed in Section 1.0 above that occur within the zone of influence of the Proposed Development, in the absence of further investigations and appropriate mitigation measures, are at risk of likely significant effects from elements of the Proposed Development. It has been determined that these European Sites occur within the zone of influence of the Proposed Development due to the presence of a potential impact pathway connecting the Proposed Development site to these European Site. These potential impact pathways include:

- Hydrological pathways arising from surface water and groundwater emissions.
- Noise emissions arising from construction phase works.
- Air emissions arising from construction phase works.
- Mobile species pathways, where the Proposed Development site was identified as supporting suitable habitat for special conservation interest bird species of SPAs listed in Section 1.0 above. Given the presence of such suitable habitat within the Proposed Development site, the potential for such species to occur on site and for *ex-situ* impacts to these species, as a result of habitat loss was screened in.
- Human distance pathways, where the operation phase of the Proposed Development will result in an increase in the human population in close proximity to the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA, with potential consequences for relevant qualifying species of interest of these two European Sites, namely otters and kingfisher.

Figures 1.1 and 1.2 provide an overview of the location and layout (respectively) of the proposed development, located near Drogheda, Co. Meath.

Figure 1.1 Location of the Proposed Rathmullan Development, Co. Meath.

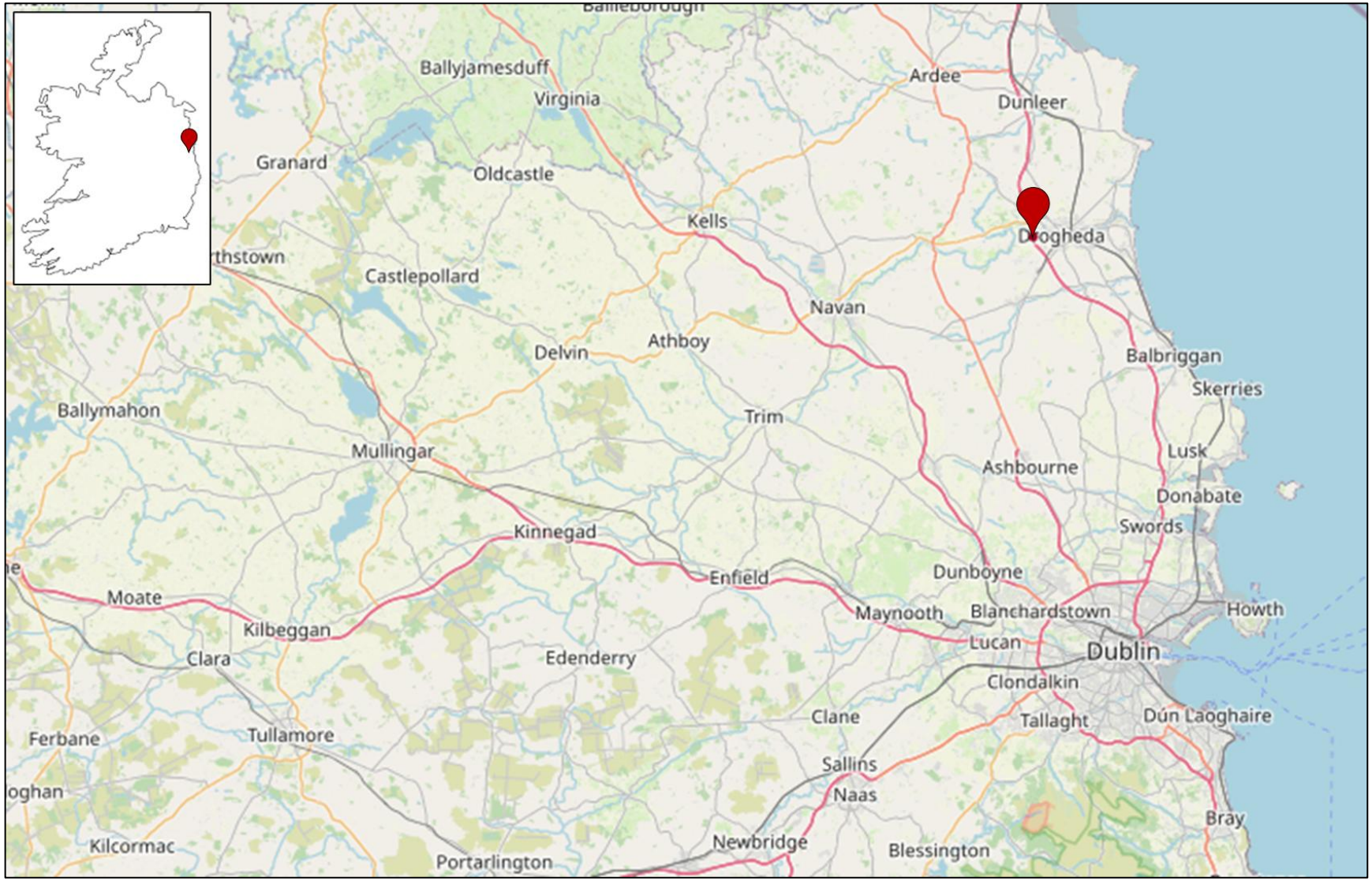


Figure 1.2 Layout of the Proposed Rathmullan Development, Co. Meath.

2 PROPOSED DEVELOPMENT DESCRIPTION

2.1 Overview

The proposed development consists of (i) demolition/removal of all existing farm buildings/structures and associated hard standing on site; (ii) construction of a large-scale residential development (LRD) of 249 no. units comprising 170 no. two-storey houses (including 37 no. two-bedroom houses, 111 no. three-bedroom houses and 22 no. four-bedroom houses), 16 no. three-storey duplex buildings (accommodating 16 no. one-bedroom and 16 no. two-bedroom units) and a mix of 8 no. three-storey and 3 no. four-storey apartments blocks accommodating a total of 22 no. one-bedroom and 25 no. two-bedroom apartments); (iii) construction of a new vehicular entrance and access road off Rathmullan Road with associated junction works and associated internal access road network with pedestrian and cyclist infrastructure; (iv) provision of a three-storey creche facility (411sq.m) with external play areas at ground and second floor levels and vehicular/bicycle parking area; and, (v) all ancillary site and infrastructural works, inclusive of removal of existing vehicular entrances, general landscaping and public open space provision, vehicular parking provision (396 no. spaces in total), bicycle parking, boundary treatments, foul/surface water drainage, attenuation areas, provision of a pumping station and provision of an ESB substation, as necessary to facilitate the proposed development. Each house will be served by vehicular parking to the front and private amenity space in the form of a rear garden. Each duplex building will be served by vehicular parking to the front and private amenity space in the form of balcony/terrace spaces to the rear. Each apartment block will have shared access to adjoining car parking bays with communal amenity space and bicycle/bin stores provided to the rear and each apartment will be provided with private amenity space in the form of a balcony or terrace. The development includes provision of a landscaped area of public open space to the north of the site, with 2 no. pedestrian/cyclist connections (via the northern/eastern site boundaries) to Rathmullan Road which will be subsequently ceded to Meath County Council.

2.2 Surface Water Management

2.2.1 Introduction

It is proposed that the surface water from the Proposed Development shall drain via gravity and discharge at a restricted rate into the existing 1200mm culvert adjacent to Rathmullan Road at the northeast of the site. This culvert merges into a ditch on the opposite side of the existing road 120m to the north of the proposed outfall location. The ditch travels for c.60m northwards before outfalling into the River Boyne which is tidal at this location.

Runoff will be restricted to the equivalent of the existing greenfield runoff and excess stormwater will be attenuated on-site. Surface water runoffs will be restricted through the incorporation of hydrobrakes or similar infrastructure.

The surface water strategy is outlined in the below sections. The surface water network for the subject site has been divided into two catchments, the Northern Catchment and the Southern Catchment. Both catchments will operate in series with runoff from the Southern Catchment flowing into the downstream Northern Catchment area at a restricted rate and outfalls into the existing 1200m surface water culvert/open drain adjacent to the Rathmullan Road.

The rainfall runoff for the Proposed Development will be limited to the equivalent of the existing agricultural runoff rate (Qbar). The greenfield runoff rate for the site has been calculated using the Institute of Hydrology report No 124 "Flood Estimation for Small Catchments". The attenuation storage for the Southern Catchment which has been sized to accommodate a Qbar runoff rate for the Southern Catchment is 10.70l/s, while this figure is 11.23l/s in the case of the Northern Catchment. Surface water runoff will be restricted via hydrobrakes which will be installed at the outfall manhole of each water catchment with excess storm water attenuated in grass detention basins with Stormtech tanks below, or similar approved. It is noted that a hydrobrake will be installed at the Northern Catchment outfall (where it drains to the existing culvert on Rathmullan Road) and that this will result in a restricted overall runoff rate of 21.93l/s (sum of Southern and Northern Catchments).

Additionally, sustainable urban drainage systems have been implemented within the Proposed Development to ensure that the runoff quality and rate are managed in accordance with the recommendations of the Greater Dublin Strategic Drainage Scheme, GDSDS.

2.2.2 Surface Water – General

Sustainable Urban Drainage systems (SUDS) have been developed and are in use to alleviate the detrimental effects of traditional urban storm water drainage practice that typically consisted of piping runoff of rainfall from developments to the nearest receiving watercourse. Surface water drainage methods that take account of quantity, quality and amenity issues are collectively referred to as sustainable urban drainage systems; they are typically made up of one or more structures built to manage surface water runoff.

The proposed surface water drainage system for this development has been designed as a sustainable urban drainage system and uses water butts, permeable pavement, grass swales, attenuation storage together with flow control device and petrol interceptor to:

- Treat runoff and remove pollutants to improve quality
- Restrict outflow and to control quantity
- Increase amenity value

Strict separation of surface water and wastewater will be implemented within the development. Drains will be laid out to minimise the risk of inadvertent connection of waste pipes etc. to the surface water system.

Surface water local drains will be 150mm to 225mm and generally will consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6). These drains will be laid to comply with the Requirement of the Building Regulations 2010. Surface water public sewers will be 225mm to 750mm and generally will consist of PVC or concrete socket and spigot pipes (to IS 6) and laid strictly in accordance with the requirements of Meath County Council.

2.2.3 Storage

The site has been sub-divided into two catchments in terms of surface water management, the Northern Catchment and the Southern Catchment. The total impermeable area of including roads, footpaths, carparking and roofs is approximately 3.299Ha.

Excess stormwater shall be attenuated in an attenuation tank combined with a detention basin, which provides c. 1311.35m^3 of storage to cater for the northern catchments. While for the southern catchment, the excess stormwater will be attenuated in an attenuation system combined with an overground detention basin and an underground attenuation storage which give a total storage of c. 1110.4m^3 as calculated.

2.2.4 Sustainable Urban Drainage System (SUDS) Criteria

The SuDS selection process used for this site is in accordance with SuDS selection flow chart, Volume 3, Section 6.5, Figure 48 of the GDSDS. The characteristics of the site are utilised to select the various SuDS techniques that would be applicable. The applicant has considered the use of all appropriate SuDS devices as part of the site SuDS strategy.

- Water Butts – utilised within each residential unit
- Permeable Pavement
- Swales – utilised in grass verges alongside internal roads
- Grass Detention Basin/Attenuation Storage – located at the green open space areas
- Flow Control Device (e.g. hydrobrake) – installed at the outfall manhole of each catchment
- Petrol Interceptor – installed downstream of each flow control device manhole

The effectiveness of each SuDS/drainage mechanism proposed is outlined below:

- **Water Butts:** It is proposed to provide water butts for the individual dwellings for external gardening and wash down use only, which will ensure interception of roof runoff at source.
- **Permeable Pavement:** Permeable pavement reduces the overall impermeable area of the hard standing area, which will reduce the impact of the discharge and improve the quality of the effluent from the proposed development. Permeable pavement will be provided in private driveway areas. The permeable paving is provided for the purposes of improving the quality of the surface water runoff. No reduction in the rate of run-off as a result of the permeable paving provision is allowed for in the surface water calculations which assumes the system is in a saturated state.
- **Swales:** Roadside swales have been incorporated in the grass verges where appropriate throughout the site. The swales incorporate an infiltration trench at the invert of the swales which will encourage surface water to drain direct to ground as recommended by SUDS. Any remaining water which does not filtrate direct to ground will drain to the surface water network.

- **Grass Detention Basin/Attenuation Storage:** The system attenuates surface water to restrict the outflow to the equivalent of the existing agricultural runoff. This ensures the development will not give rise to any impact downstream of the site.
- **Flow Control Device:** It is proposed to provide a hydrobrake, or similar approved, at the outfall of each surface water catchment to restrict the outflow of water from the subject site. The hydrobrakes will be fitted with a pull cord bypass and a penstock valve installed on the inlet to the manhole for maintenance purposes.
- **Petrol Interceptor:** It is proposed to provide a petrol interceptor prior to each outfall into the attenuation in order to ensure primary treatment of any pollutants. It is proposed to provide a Klargestor Bypass Separator Type NSP003 or similar approved.

In conclusion the water quality from this catchment should be of a high quality due to the above-mentioned measures, which are applied in a treatment train to treat the water before discharge at a restricted rate to the local network. The above measures ensure a suitable management train is provided.

Management Train: The management train commences with source control through the provision of water butts and draw off taps in each dwelling for external reuse only. This will also reduce the water consumption required of each housing unit.

The second stage of the management train, site control, is provided by the introduction of permeable pavement and swales, all of which provide a degree of treatment before discharging to the proposed surface water network and detention basin. The rate of runoff is controlled through the provision of a flow control device installed in the outfall manhole of each surface water catchment.
The underground attenuation offers a third stage of treatment, regional control, by slowing the storm water discharge down, promoting infiltration and removing additional silts which may remain in the storm water.

2.2.5 Wastewater Management

It is proposed that the foul sewerage from the site will drain via a new network of gravity sewers to a new pumping station located at the low point in the northeastern corner of the subject site. Foul water will be pumped from the new pumping station and connect to the existing 110mm diameter rising main on Rathmullan Road to the east of the subject site. This will require c. 300m of new 110mm rising main below the internal estate roads and a section of Rathmullan Road. Ultimately this foul water discharges into the existing gravity sewer network on Marley's Lane c. 900 m east of the subject site. Foul drainage eventually outfalls to the Drogheda Wastewater Treatment Plant.

2.2.6 Irish Water Pre-Construction Enquiry

Two pre-connection enquiries (PCEs) were submitted to Uisce Eireann each for 99 no. residential units based upon the development being constructed in two phases (CDS23000770 & CDS23000784). Confirmations of feasibility (CoFs) for 198 no. residential units have been received. Based on the two CoFs received, a PCE that covers for 249 no. residential

units was sent to the Uisce Eireann in November 2024, CDS24009836. Confirmation of feasibility was received on 26th April 2025.

The proposed pumping station will pump wastewater to the existing foul water drainage network at the junction of Rathmullan Road/Marley's Lane. There is an existing rising main along the Rathmullan Road which runs from the entrance of the Proposed Development to Marley's Lane. Uisce Eireann have indicated in their CoF that this existing rising main could be utilised for the proposed development. The proposed new pumping station will be designed to facilitate flows from the adjacent Riverbank and Oldbridge Manor Developments

2.2.7 Foul Water – General

Foul water sewers within the Proposed Development will be laid to comply with the requirements of the Building Regulations, and in accordance with the recommendations contained in the Technical Guidance Documents, Section H of the Engineering Assessment Report, provided under separate cover with the planning application documentation.

Foul water sewers which will be taken into charge will be laid strictly in accordance with Irish Water's requirements for taking in charge. In accordance with the Irish Water *"Code of Practice for Wastewater Supply*", 150mm nominal internal diameter sewers have been proposed for carrying wastewater from 20 properties or less; whilst 225mm nominal internal diameter carrying wastewater from more than 20 properties. Furthermore, where there are at least ten dwelling units connected, the 150mm diameter pipes are laid at a minimum gradient of 1:60 for up to nine connected dwelling units.

The pumping station has been located with a 20m separation distance from the nearest dwelling. This complies with Section 5.5 of the Irish Water *"Code of Practice for Wastewater Supply"*, which states that Type 3 pumping stations require a minimum buffer zone of 15m.

2.2.8 Foul Water Pumping Station & Preliminary Specification

General

As set out in 2.3.1 above, it is proposed to construct a new pumping station at the northeastern side of the site. The pumping station will be sized to accommodate the proposed development. The proposed pumping station will be designed in compliance with the Irish Water Code of Practice and Irish Water Standard Details.

The proposed pump station has provision for foul water storage from the Proposed Development with a total capacity of 261m^3 which has sufficient storage to cater the foul.

Emergency Storage

The total volume of storage available in the pump sump to this level is c.10.828m^3 with a further 268.76m^3 available in the adjacent storage tanks.

In addition, there is storage available in the foul water manholes and sewers. At 3.154l/sec (1*DWF) the total volume required to be stored in a 24-hour period is 268.76m^3, which is less than the emergency storage available.

Emergency Equipment & Procedures

The pumping station is being provided with the following emergency equipment and procedures:

- Standby pump in the event of a pump failure
- Telemetry system to facilitate Irish Water monitoring of the station
- High level alarms to warn of increases in level of effluent in the pump sump
- Storage capacity within the sump and pipe network in excess of 24 hours
- Over-pumping facilities on the rising main to facilitate the installation of a temporary external pump to empty the sump directly into the rising main

The above emergency equipment and procedures provide a very high level of redundancy and backup in the event of a failure in the mechanical systems in the pumping station.

2.2.9 Water Supply

Water supply to the subject site will be provided via a new proposed connection to the existing 150mm HPPE watermain on Rathmullan Road to the east of the site. All water supply details shall be in accordance with Irish Water requirements. Please refer to Waterman Moylan Drawing No's. 18-014-P481&P482-Water Supply Layout -Rev A, provided under separate cover with the planning application documentation, for details of the watermain layout to serve the subject site.

2.2.10 Irish Water Pre-Connection Enquiry

Two pre-connection enquiries (PCEs) were submitted to Uisce Eireann each for 249 no. residential units based upon the development being constructed in 2 phases (CDS23000770 & CDS23000784). Based on the two CoFs received, a PCE that covers for 249 no. residential units was sent to the Uisce Eireann in November 2024, CDS24009836. Confirmation of feasibility was received on 26th April 2025.

Water supply to the subject site will be connected to the existing 150mm watermain which will be upgraded to 200mm diameter on the Rathmullan Road. c.140m of existing 150mm diameter watermain needs to be upgraded to 200mm diameter along Rathmullan Road. There is also a requirement for c. 50m new 450mm diameter watermain together with a new flow control valve. All upgrade works will be carried out by Uisce Eireann as part of the connection agreement. All water supply details shall be in accordance with Irish Water requirements. Please refer to Waterman Moylan drawing No. 18-014-P481&P482- Water Supply Layout -Rev A for the proposed watermain network layout

2.2.11 Water Supply – General

Water mains suitable for works and approved by Irish Water shall be either ductile iron (DI) or polyethylene (PE), with PE80 or PE100 rating (MDPE, HDPE or HPPE).

The minimum depth of cover from the finished ground level to the external crown of a water main shall be 900mm. A greater depth of cover and/or greater strength pipe and/or a higher class of bedding may be required where high traffic loading is anticipated. Depths may be altered to avoid obstructions, including separation distances between other utility services. The desirable maximum cover for a service connection pipe or a water main should be 1200mm, where practicable.

Sluice valves will be provided so that no more than 40 houses can be isolated at any time and hydrants provided so that each part of the dwellings are within 46m of a hydrant.

2.3 Landscaping

A landscape masterplan has been prepared for the Proposed Development and is provided under separate cover with the planning application documentation. The landscape masterplan provides for the enhancement of woodland habitats to the north and east of the Proposed Development site as well as providing meadow habitat and standard tree planting throughout the site.

2.4 Lighting

Public lighting will be provided as part of the Proposed Development. The extent of the public lighting to be provided is described in detail in the Public Lighting Report, provided under separate cover with the planning application documentation. The lighting contour is located well outside of the River Boyne and River Blackwater SAC to the north and as well as woodland habitats and proposed woodland habitats that will be provided as part of the landscape masterplan for the Proposed Development.

2.5 Construction Phase Specific Works

2.5.1 Designated Storage Area & Site Compound

At least one temporary site compound, including offices and welfare facilities, will be constructed by the main contractor in a location or locations to be decided within the subject site.

The main contractor will be required to schedule delivery of materials on a daily basis. The main contractor shall use the constructed site compound(s) on the site for the secure storage of materials.

Prevention and mitigation measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from oil and petrol leakages and significant siltation. Suitable bunded areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the main contractor to cater for any other spills.

2.5.2 Deliveries & Site Access

Deliveries and access to the construction site will typically be made via the Rathmullan Road to the east of the site. Construction traffic will not be permitted to use the River Road to the north of the site or the local Sheephouse Road to the south of the site as these would be considered unsuitable for construction traffic. Haul roads for construction traffic purposes will generally be 6.0m wide and will be constructed using 300mm minimum capping layer material (clean broken stone).

In the event that large concrete pours are required which may result in congestion at the entrance to the site the deliveries will be organised such that concrete trucks will queue at a pre-determined staging point (such that they do not cause an obstruction to general traffic in the area) and will then be called in by radio as appropriate to the site, via a pre-determined route and to the required access gate. Set procedures and designated wash-out areas will be provided. All delivery vehicles will be co-ordinated as required at the relevant access point.

2.5.3 Working Hours for Construction Works

It is envisaged that working hours for the Construction Phase will be between 08.00 and 17.00 Monday to Friday (subject to any specific condition(s) to which a potential grant of permission might be subject).Special construction operations may occasionally need to be carried out outside typical working hours in order to minimise disruption to the surrounding area. Weather restrictions may apply, e.g. no cement pouring during heavy rainfall. These restrictions shall be determined by the project ecologist taking into account pertaining environmental factors on site.

2.5.4 Plant and Equipment

The amount of plant, equipment and labour at the site will be proportional to the extent of the activity underway at any one time. Typical plant and equipment for use is expected to include the following:

- 13 tonne excavator(s)
- 6t dumper truck(s)
- Teleporter(s)
- Cement mixer(s)
- Tractor/trailer(s)
- Bulldozer/Grader(s)
- Telescopic Handler(s)
- Compactors/loader(s).
- Pile driver(s)
- Crane(s).

A full inventory of specific plant and equipment will be supplied by the Contractor upon appointment and the Construction Environmental Management Plan (CEMP) will be updated accordingly.

3 LEGISLATION

3.1 International Legislation

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the "Habitats Directive" (EC, 1992), 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 Natura 2000. 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 (EC, 2009).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to have a significant effect on or to adversely affect the integrity of European Sites (Annex 1.1). Article 6(3) establishes the requirement for 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 Natura 2000 sites is protected. It shall inform the Commission of the compensatory measures adopted*."

3.1.1 The Requirement for AA Screening

Section 42 (1) of S.I. No. 477 of 2011, the European Communities (Birds and Natural Habitats) Regulations 2011 states (ISB, 2011):

"*A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site*."

Where the screening process cannot exclude the possibility that a plan or project, individually or in combination with other plans or projects, could have a significant effect on a European Site, there is a requirement under Article 42 (9) of these Regulations for the preparation of a Natura Impact Statement to inform the Appropriate Assessment process.

3.1.2 Screening Determination

In accordance with Regulation 42(7) of the Birds and Natural Habitats Regulations 2011 (S.I. No. 477/2011) as amended (ISB, 2011):

"The public authority shall determine that an Appropriate Assessment of a plan or project is not required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site."

Further, under Regulation 42(8):

"(a)Where, in relation to a plan or project for which an application for consent has been received, a public authority makes a determination that an Appropriate Assessment is required, the public authority shall give notice of the determination, including reasons for the determination of the public authority, to the following—

i. the applicant,

ii. if appropriate, any person who made submissions or observations in relation to the application to the public authority, or

iii. if appropriate, any party to an appeal or referral.

(b) Where a public authority has determined that an Appropriate Assessment is required in respect of a proposed development it may direct in the notice issued under subparagraph (a) that a Natura Impact Statement is required."

3.2 National Legislation

The Habitats Directive has been transposed into Irish law by Part XAB of the Planning and Development Act, 2000 – 2015 (Law Reform Commission, 2010) and the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011) as amended (ISB, 2011).

3.3 Guidance Documents on Appropriate Assessment

Where an AA is necessary, the AA requirements of Article 6(3) of the Habitats Directive 92/43/EEC (EC, 1992) follow a sequential approach as outlined in the following guidance documents:

- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 and PSSP 2/10 (NPWS, 2010).
- Appropriate Assessment of Plans and Projects in Ireland – guidance for Planning Authorities. Revised 2010. (DEHLG, 2009).
- Guidelines for Good Practice Appropriate Assessment of Plans Under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011).
- Managing Natura 2000 Sites: The provisions of Article 6 of the Habitat's Directive 92/43/EEC Commission Notice (EC, 2018).

- Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021a).
- ANNEX to the Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021b).
- The Department of the Environment, Heritage, and Local Government guidance "Appropriate Assessment of Plans and Projects in Ireland – guidance for Planning Authorities, 2009" and the European Commission (2001) guidelines "Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
- National Parks and Wildlife Service (NPWS) Protected Areas Maps & Metadata (accessible online at; https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba)
- National Parks and Wildlife Service (NPWS) Protected Areas Site Synopses and Conservation Objectives Documentation
- EPA maps (accessible online at; https://gis.epa.ie/EPAMaps/?s=map)

3.4 Overview of Methodology for Appropriate Assessment

3.4.1 Overview of the Stages of Appropriate Assessment

The AA process is a sequential process consisting of four potential stages. If at the first stage in the process it is determined that there will be no significant effect on a European Site, the process is effectively completed. The four stages are as follows:

- Stage 1 – Screening of the proposed plan or project for AA (current stage);
- Stage 2 – An AA of the proposed plan or project;
- Stage 3 – Assessment of alternative solutions; and
- Stage 4 – Imperative Reasons of Overriding Public Interest (IROPI)/ Derogation.

Stage 1 relates to Regulation 42 of the Birds and Natural Habitats Regulations (ISB, 2011); and Stage 2 relates to Article 6(3) of the Habitats Directive; and Stages 3 and 4 to Article 6(4) of the Habitats Directive (EC, 1992).

3.4.2 Stage 1: Screening

The aim of screening is to assess if the plan or project is directly connected with or necessary to the management of European Site(s); or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a European Site. This is done by examining the proposed plan or project and the conservation objectives of any European Sites that might potentially be affected. If screening determines that there are likely to be significant effects, or the significance of effects are uncertain or unknown then it will be recommended that a project is brought forward to full AA.

3.4.3 Stage 2: Appropriate Assessment (Current Stage)

The aim of Stage 2 of the AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European Sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Stage 3.

3.4.4 Stage 3: Assessment of Alternative Solutions

If it is not possible during the Stage 2 to reduce impacts to acceptable, non-significant levels by avoidance and/or mitigation, Stage 3 of the process must be undertaken which is to objectively assess whether alternative solutions exist by which the objectives of the plan or project can be achieved. Explicitly, this means alternative solutions that do not have significant negative impacts on the integrity of a European Site. It should also be noted that EU guidance on this stage of the process states that, 'other assessment criteria, such as economic criteria, cannot be seen as overruling ecological criteria' (EC, 2002). In other words, if alternative solutions exist that do not have negative impacts on European Sites; they should be adopted regardless of economic considerations.

3.4.5 Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

This stage of the AA process is undertaken when it has been determined that negative impacts on the integrity of a European Site will result from a plan or project, but that no alternatives exist. At this stage of the AA process, it is the characteristics of the plan or project itself that will determine whether the competent authority can allow the plan or project to progress. This is the determination of 'over-riding public interest'. It is important to note that in the case of European Sites that include in their qualifying features 'priority' habitats or species, as defined in Annex I and II of the Directive, the demonstration of 'overriding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for 'human health or safety considerations'. Where plans or projects meet these criteria, they can be allowed, provided adequate compensatory measures are proposed. Stage 4 of the process defines and describes these compensation measures

4 METHODS

4.1 Development Site Habitat Assessment Methods

A general assessment of the site was carried out by Verde ecologist Dr. Jeff Hean on the 17th of June 2025. The site assessment was in line with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011) and habitats were classified to level 3 of the Fossitt (2000) classification system. To illustrate the general habitat quality, photographs were taken using a digital camera. Grid references were recorded using a GPS handset. Site evaluation is based on the guidelines of the Chartered Institute of Ecology and Environmental Management (CIEEM 2019). The site and immediate surroundings were inspected for the presence of invasive species, as listed in the First Schedule of the Birds and Natural Habitats Regulations (S.I. No. 477/2024). Regulation 49 (2) states that "*any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place any plant listed in the Third Schedule, shall be guilty of an offence*".

The determination of the presence or absence of Annex I habitats was carried out in consultation with the habitat descriptions provided in the most recent Article 17 Reports (NPWS, The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview., 2019). The Interpretation Manual of European Union Habitats (EUR 28, April 2013) was also consulted. In addition, the spatial GIS data for the Article 17 Reports were examined to determine the distribution of these habitats (as known to the NPWS) within the study area.

All surveys were completed by qualified specialists and in accordance with relevant legislation, particularly the "Guidelines for Ecological Impact Assessment in the UK and Ireland" (CIEEM, 2018) through the additional recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance.

4.2 Scientific Investigations

A range of in-situ ecological surveys were completed at the Proposed Development site. These surveys were completed between 2021 and 2025 for the current Proposed Development as well as a range of investigations that were completed for a previous planning application for lands within and surrounding the Proposed Development site.

4.3 Key Ecological Receptors

Investigations completed with respect to biodiversity and that specifically relate to European Sites in the wider surrounding area include habitat surveys and an evaluation of the habitats occurring on site to function as a suitable for otters, lamprey species and Atlantic salmon, all of which are qualifying species of the River Boyne and River Blackwater SAC, which is located to the north of the Proposed Development site. The habitat surveys were used to evaluate the potential for the Proposed Development site to offer suitable habitat for special conservation interest bird species or other waterbirds associated with the River Boyne and River Blackwater SPA; Boyne Estuary SPA, and the North-West Irish Sea SPA.

4.3.1 Non-Volant Mammals

A search for field signs indicating the presence of non-volant mammals within and adjacent to the Proposed Development site was completed on the 24th May, 10th June and 28th July 2022, 9th February 2023, and 10th April 2025. These field signs, as described in Neal & Cheeseman (1996) and Bang & Dahlstrom (2006), include:

- Mammal breeding and resting places, such as setts, holts, lairs;
- Pathways & prints;
- Faecal deposits & latrines (and dung pits used as territorial markers);
- Feeding signs (snuffle holes);
- Hair; and
- Scratch marks.

The surveys for non-volant mammals were completed after periods of dry weather when field signs were more likely to be present.

4.3.2 Avifauna

Conditions on site have been surveyed for their potential to function as a foraging habitat for wintering birds. Dedicated surveys for the presence of special conservation interest bird species or waterbirds of the above listed SPAs were completed during the 2020/2021, 2021/2022 and 2024/2025 non-breeding bird season, when wintering special conservation interests of these SPAs are present. Certain special conservation interest bird species of these SPAs, as identified in the screening report, are known to rely on agricultural land such as grassland and stubble for foraging and roosting, especially during high tide when intertidal foraging habitats are inundated. For instance, golden plover and lapwing, both of which are special conservation interest bird species for the Boyne Estuary SPA are considered to be examples of terrestrial waders (NPWS, 2012b). Given that the greatest likelihood of these species occurring at the Proposed Development site was during high tides, the majority of field surveys completed at the Proposed Development site were completed to coincide with high tide when waders and other waterbirds are most likely to use terrestrial habitats for foraging or roosting. Low-tide surveys were also completed so that baseline information relating to ex-situ waterbird movements from SPAs to the Proposed Development site and the vicinity of the Proposed Development site could be gathered. There is no formal methodology published for the surveying of wintering waterbirds on terrestrial sites. Surveys of waterbirds at low-tide to inform IWeBS surveys and surveys at coastal SPAs rely on 4 low-tide survey counts completed between the months of September and March. This is consistent with the British Trust for Ornithology (BTO) method of four surveys during the winter season, ideally during the months of November to February. Bird surveys were completed on the following dates:

Table 3.1 Summary of Bird Surveys Undertaken at the Proposed Development Site.

Date	Survey Focus
29th January 2021	Winter Birds
12th February 2021	Winter Birds
25th February 2021	Winter Birds
24th March 2021	Winter Birds
1st April 2021	Date is during the breeding season but overlaps with the migratory period for wintering species
16th April 2021	Date is during the breeding season but overlaps with the migratory period for wintering species
30th November 2021	Winter Birds
15th December 2021	Winter Birds
10th January 2022	Winter Birds
24th May 2022	Breeding Birds
10th June 2022	Breeding Birds
28th July 2022	Breeding Birds
9th February 2023	Winter Birds
25th June 2024	Breeding Birds
18th July 2024	Breeding Birds
26th August 2024	Breeding Birds
30th September 2024	Breeding Birds
24th October 2024	Winter Birds
26th November 2024	Winter Birds
19th December 2024	Winter Birds
31st January 2025	Winter Birds
14th February 2025	Winter Birds
12th March 2025	Winter Birds
21st April 2025	Breeding Birds
30th May 2025	Breeding Birds

Surveys on the above listed dates were completed from a vantage point on the public road located to the south of the development site, where a view over the entire site is afforded. In addition to the vantage point survey, the lands within the Proposed Development site were walked on each survey occasion at the end of the vantage point to confirm presence/absence of waterbirds at the Proposed Development site. Based on the survey effort required for low tide surveys and the survey effort used to inform other large-scale projects it is considered that the survey effort undertaken to establish the use of the Proposed Development site by terrestrial waders or other waterbirds provides a robust evidence base for the examination of this aspect in this NIS and is representative of best scientific information.

4.3.3 Bat Roost Surveys

The daytime inspections of structures were completed on the 24th May, 10th June and 28th July 2022; and again in June 2024 and April 2025. Dedicated bat activity surveys were completed on site on the 24th May and 10th June 2022 and the 25th June and 18th July 2024. This involved roost emergence surveys at the structure on site as well as continuous static detector monitoring at the Proposed Development site between the 24th May and the 10th July 2022 and again between the 25th June and 7th July 2024.

During the 2022 survey one Song Meter SM4 Full Spectrum bat detector was deployed on site to monitoring bat activity continuously during the monitoring completed between these dates. The static bat detector was positioned along hedgerow habitat and an agricultural shed within the Proposed Development site. The static detector was mounted at a height of 3m above the ground and was set to recorded bat activity continuously throughout each night of the monitoring period, with recording commencing at 30 minutes prior to sunset and 30 minutes after sunrise.

During the 2024 survey two no. Song Meter SM4 Full Spectrum bat detectors were deployed on site. The 2024 monitoring point no. 2 was as per the 2022 monitoring point described above. The monitoring point No. 1 was positioned towards the west of the site along a field boundary hedgerow.

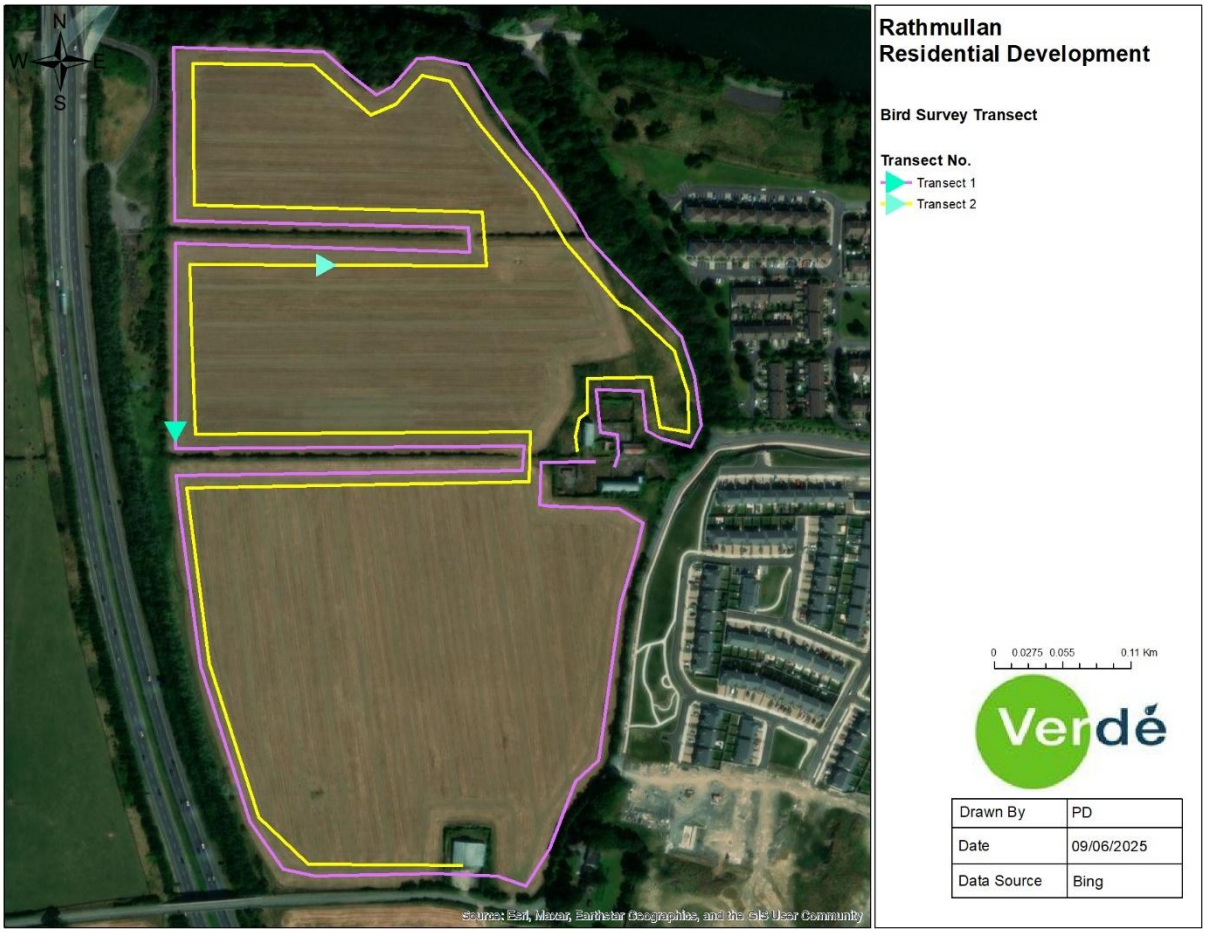
Roost emergence surveys were completed at the structures occurring at the Proposed Development site during the 2022 and 2024 bat activity seasons. The emergence surveys were completed during the 2022 season on the 24th May and 10th June. These emergence surveys focused on surveying the structures at the farmyard complex at the centre-east of the site. A survey position was taken up on the hardstanding between the farm structures so that a view of all structures was afforded during the survey. The emergence survey commenced 30 min prior to sunset and continued for 90 minutes after sunset.

Roost surveys were again completed during the 2024 bat activity season, on the 24th June and 18th July. The emergence survey on the 25th June was completed at the farmyard complex at the centre-east of the site. The survey position was as per the 2022 survey. The 18th July survey was completed at the agricultural shed adjacent to the southern boundary of the site. The emergence survey commenced 30 min prior to sunset and continued for 90 minutes after sunset.

A manual transect survey was also completed during the manual survey on the 24th May 2022 (transect 1) and the 10th June 2022 (transect 2), following the completion of the roost emergence survey at the remaining structure on site. The transect route is shown on Figure 3.1. The manual transect survey was repeated during on 25th June 2024 and 18th July 2024.

Figure 4.1 Direction and Layout of Survey Transects.

Bat calls recorded by the SM4 Bat detectors during the automatic bat monitoring sessions were analysed using



Kaleidoscope Pro (v. 5.4.1 (for 2022 data and v. 5.7.0 for 2024 data) software. Kaleidoscope automatic bat identification software was used to assign bat calls to species level. Bat calls assigned to Myotis species were grouped together under the Myotis genus

5 RESULTS

5.1 Habitats

The following sub-sections describe the habitats occurring within and surrounding the Proposed Development site. Each habitat described below has been identified to Level 3 of Fossitt's Guide to Habitats in Ireland. The alpha-numeric code for each habitat is also provided alongside the habitat name (e.g. hedgerow WL1). The locations and extent of each habitat described below are illustrated in Figure 4.1. The habitats occurring within the Proposed Development site boundary include,

5.1.1 Arable Land (bc1)

Arable land dominates the land cover within the Proposed Development site. This habitat supported a crop of barley (*Hordeum vulgare*) during field surveys. The crop is harvested during the summer months and the fields in which the Proposed Development site is located is then treated as a winter stubble field prior to subsequent sowing. It was previously used as horticultural land (BC2) for the production of broad beans (*Vicia faba*). This habitat is subject to intensively agricultural management with tilling, nutrient and herbicide application forming part of the management activities.

5.1.2 Buildings and Artificial Surfaces (BL3)

Structures occur to the south of the Proposed Development site. These are representative of farm structures that are in a general state of disrepair with gaps and missing sheets associated with the corrugated roofs. Paved surfaces occur at the farmyard and this land cover is also representative of this habitat type.

5.1.3 Dry Meadows and Grassy Verges (GS2)

Dry meadows and grassy verges habitats occur to the east of the Proposed Development site between the Proposed Development site and the Rathmullan Road. It occurs on steeper east facing slopes within the Proposed Development site. These are grasslands that are infrequently managed through cutting or grazing. Species included cock's-foot (*Dactylis glomerata*), bent grasses (*Agrostis spp*.), common couch (*Elytrigia repens*) and Yorkshire fog (*Holcus lanatus*) false oat-grass (*Arrhenatherum elatius*), fescues (*Festuca spp*.) and perennial rye-grass (*Lolium perenne*). Herbs included winter heliotrope (Petasites pyrenaicus), nettle (*Urtica dioica*) plantain (Plantago lanceolata), wild carrot (Daucus carota). common knapweed (*Centaurea nigra*), common nettle (*Urtica dioica*), cleavers (*Galium aparine*), willowherb species (Epilobium sp.) and meadow buttercup (*Ranunculus acris*). Invading scrub and tree species include gorse (*Ulex europaeus*), bramble (*Rubus fruticosus agg*.) and eared willow (*Salix aurita*) also occur.

5.1.4 Oak-Ash-Hazel woodland (WN2)

Oak-Ash-Hazel Woodland (WN2) is present along the northern and north-eastern boundary of the Proposed Development site on a steeper north and northeast facing gradients that slope down to Rathmullan Road. This is the most important habitat on the subject lands as it is suitable habitat to support mammal species such as deer, badgers and foxes. This habitat is dominated by ash (*Fraxinus excelsior*), hazel (*Corylus avellana*) and English elm (*Ulmus procera*). Other tree species present include pedunculate oak (*Quercus robur*), beech (*Fagus sylvatica*), sycamore (*Acer*

pseudoplatanus). The understorey comprises elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus agg*). The canopy cover was heavy resulting in a diminished ground flora dominated by mosses, ferns and common ivy (*Hedera helix*). The ferns present included lady-fern (*Athyrium fliix-femina*), soft shield-fern (*Polystichum setiferum*) and Hart's tongue (*Asplenium scolopendrium*). Mosses (*Plagiomnium undulatum*), and (*Thuidium tamariscinum*) on the floor of the habitat, (*Mnium hornum*), (*Isothecium alopecuroides*), and (*Neckra complanate*) on the bases of the trees and (*Bryum argentums*) on rocks. Ground flora identified included herb robert (*Geranium robertianum*), herb bennet (*Geum urbanum*), opposite leaved golden saxifrage (*Chrysosplenium oppositifolium*), meadow buttercup (*Ranunculus acris*), primrose (*Primula vulgaris*), honeysuckle (*Lonicera periclymenum*) and lords and ladies (*Arum maculatum*). Cow parsley (*Anthriscus sylvestris*) and ground elder (*Aegopodium podagraria*) were noted within the habitat closer to the road. This habitat corresponds to the Irish Vegetation Community WL2C *Fraxinus excelsior-Acer pseudoplatanus* woodland, which is a relatively species-poor woodland type. Analysis of the relevé data against definitions of EU annex I habitats determined that the woodland does not correspond to [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*), due to the absence of typical species for the habitat.

5.1.5 Scrub (WS1)

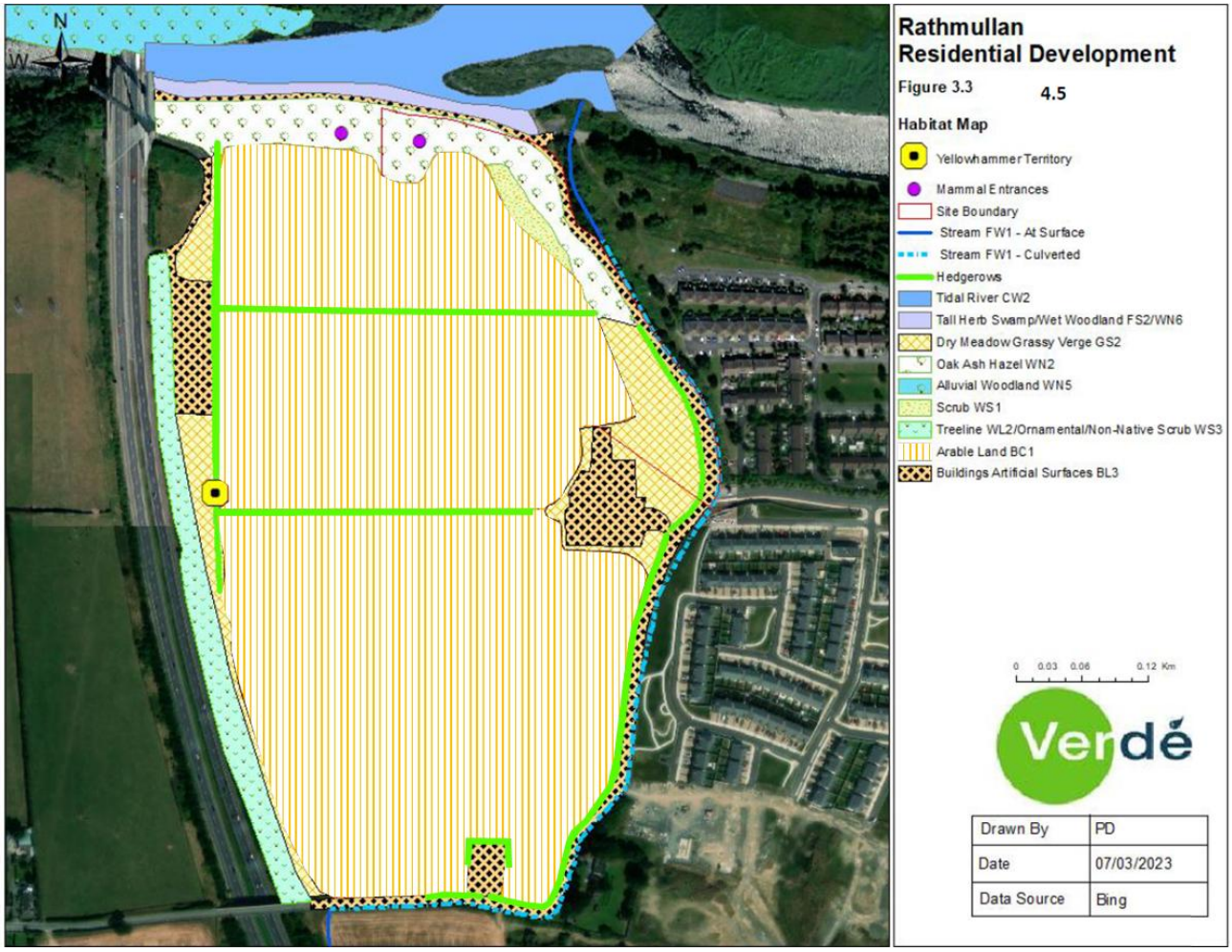
Scrub habitat has development along the boundary of the oak-ash-hazel woodland. This scrub habitat is entirely dominated by stands of spreading (*Rubus fruticosus agg*).

5.1.6 Hedgerow (WL1)

Hedgerows are present within the Proposed Development area running north to south along the eastern boundary of the Proposed Development site and east to west, separating fields, through the Proposed Development site. These hedgerows are evaluated as being of moderate value (local importance- higher value). These hedgerows are classified as important for several reasons including their dense ground cover, their role as a wildlife corridor connecting the woodland in the north of the lands with other habitats in the surrounding environment, the fact they are composed of mainly native species, and their advanced age. Tree and shrub species present in the hedgerow include hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*) and bramble (*Rubus fruticosus agg)*. Ground flora present includes common nettle Urtica dioica, greater burdock (*Arctium lappa)*, cock's foot (*Dactylis glomerata*) and cleavers (*Galium aparine*).

Figure 5.1. provides an overview of habitats and key ecological receptors observed within the boundaries of the development site and immediate surroundings.

Figure 5.1. Overview of Habitats and Key Ecological Features Observed on/near the Site.



5.2 Habitats Outside the Proposed Development Site

Other habitats occurring outside the Proposed Development site include a mosaic of treeline and ornamental and non-native scrub to the west, parallel to the M1 motorway; tall herb swamp along the southern riparian fringe of the River Boyne to the north of the Rathmullan Road, and the River Boyne which is representative of a tidal river. A minor stream, the Sheepstown Stream is located to the east of the Proposed Development site, along the eastern side of the Rathmullan Road. This stream is culverted for most of its length to the east of the road. It emerges from the culvert approximately 100m upstream of its confluence with the River Boyne. No aquatic plants were noted within the channel or on the banks. Plant species noted were typical of those of the surrounding habitat types.

An example of Alluvial woodland habitat occurs to the north of the Proposed Development site at Yellow Island. This Alluvial woodland is representative of the Alluvial woodland qualifying habitat of the River Boyne and River Blackwater SAC.

The Proposed Development will be located on an undeveloped green field site comprising c. 9.20ha and is located on Rathmullan Road in Drogheda, Co. Meath. It is situated approximately 2.5km west of Drogheda town centre and is

bounded to the north by the River Boyne valley, to the east by residential developments, to the south by agricultural lands, and to the west by the M1 Dublin to Belfast Motorway.

The Proposed Development site itself is dominated by horticultural land and is dissected and bordered by hedgerows, dry meadows and grassy verges and recolonising bare ground habitats. No watercourses were identified within the subject lands; however, the River Boyne is located directly north of the Proposed Development site and is separated from the lands by the Rathmullan Road.

5.3 Geology and Hydrology

A ground investigation contractor, IGSL, carried out an investigation at the Proposed Development to establish the prevailing ground conditions in terms of material properties. A number of trial pits were excavated using a mechanical digger as well as several boreholes using a shell and auger drill with rotary core follow on to establish the profile of the rock-head and provide information on the rock quality. The exploratory holes showed the Proposed Development to be underlain predominately from firm brown sandy gravelly CLAY. The gravelly CLAY stratum increases in strength to stiff below circa 1.20m with holes continuing to between 5.80m and 8.50m. Angular and sub-angular cobbles and boulders were noted at varying depths on the site. The ground conditions encountered reflect a typical description of the boulder clays deposited during the last glacier movement in the region and are common along the mid-eastern area of Ireland. Locally, peats reflect decay of organic materials over a significant period of time, while some fluvial glacial materials may also be encountered as a result of the water flowing from melting glaciers. The ground investigation showed that in each of the exploratory holes, the bedrock was not encountered prior to the termination of the boreholes between 5.80m and 8.50m. The final termination depths may be indicative of boulders in the glacial clay or possibly the local bedrock horizon. To confirm the depth of bedrock proof core drilling would be required.

The Bedrock Geology Map of Ireland produced by the Geological Survey of Ireland (GSI), describes the prevalent geology of the area. The Proposed Development spans an area predominately underlain by one geological formation – the Platin Formation being Crinoidal peloidal grainstone-packstone.

5.4 Hydrology and Hydrogeology

The Proposed Development is located approximately 9.6km west of the Irish Sea, with the River Boyne located to the north of the Proposed Development site. The section of the river to the north of the Proposed Development site is within the tidal stretch of the river, which extends west of the Proposed Development site to Grove Island at Oldbridge. The section of the River Boyne upstream and downstream of the Proposed Development site is representative of a transitional waterbody (i.e. it is subject to and influenced by tidal waters). The current water quality of the lower transitional waters of the River Boyne are classed as being of Moderate Status and are of less than Good Status (WFD 2016-2021). Catchments.ie (2025) have identified pressures to this waterbody as relating to agricultural pressures and urban wastewater pressures. Discharges from roads, motorway, other human activities, and agricultural fertilisation have also

been identified as sources of threats and pressures to the River Boyne and the River Boyne and River Blackwater SAC and SPA.

The bedrock aquifer beneath the site is classified by the GSI as 'Rkd: Regionally Important Aquifer – Karstified (diffuse)' (GSI, 2025). 'Karstification' is the process whereby limestone is slowly dissolved away by percolating water. It usually occurs in the upper bedrock layers and along certain factures, fissures and joints. This results in an uneven distribution of permeability through the bedrock. The landscape is generally characterised by underground drainage, with most flow occurring through the more permeable, solutionally enlarged, interconnected fissure/conduit zones. Groundwater velocities through fissures/conduits may be high and aquifer storage is often low. Groundwater often discharges as large springs (>2,000 m3/d), with a high variance in dependability. There is strong interconnection between surface water and groundwater.

No ground water was encountered during the course of the exploratory boreholes or trial holes during the site investigation. In general, the Proposed Development does not have areas of cut that would extend into the ground water table and therefore would not be expected to encroach significantly below ground into water bearing strata.

5.5 Fauna – Desktop Study

5.5.1 Bird Species

The desktop review of available information obtained from the National Biodiversity Data Centre (NBDC) between 2015 and 2025 revealed the confirmed observation of 38 bird species within the 4km^2 grid squares. Of these 38 species, 20 are listed as protected species. Table 4.1 provides an overview of bird species observed within the 2km grid squares.

Table 5.1 Summary of Bird Sighting Records within Grid Squares O07M and O07S, 2015-2025.

Common Name	Species Name	Count	Last Record	Conservation Status
Blackbird	*Turdus merula*	7	08/02/2018	
Blackcap	*Sylvia atricapilla*	3	18/11/2022	
Black-headed Gull	*Chroicocephalus ridibundus*	4	22/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Blue Tit	*Cyanistes caeruleus*	1	13/11/2016	
Buzzard	*Buteo buteo*	1	13/09/2017	
Chaffinch	*Fringilla coelebs*	6	08/02/2018	
Common Gull	*Larus canus*	1	13/11/2016	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of

Common Name	Species Name	Count	Last Record	Conservation Status
				Conservation Concern >> Birds of Conservation Concern - Amber List
Cormorant	*Phalacrocorax carbo*	4	22/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Dunnock	*Prunella modularis*	2	08/02/2018	
Goldfinch	*Carduelis carduelis*	3	12/02/2021	
Great Black-backed Gull	*Larus marinus*	1	22/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Great Northern Diver	*Gavia immer*	1	30/12/2020	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species
Greenshank	*Tringa nebularia*	1	31/12/2011	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Grey Heron	*Ardea cinerea*	3	25/04/2021	
Grey Wagtail	*Motacilla cinerea*	1	13/11/2016	
Herring Gull	*Larus argentatus*	4	22/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Hooded Crow	*Corvus cornix*	2	08/02/2018	
House Sparrow	*Passer domesticus*	2	08/02/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kestrel	*Falco tinnunculus*	1	28/02/2016	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation

Common Name	Species Name	Count	Last Record	Conservation Status
				Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lapwing	*Vanellus vanellus*	2	18/11/2022	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Little Egret	*Egretta garzetta*	3	25/04/2021	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species
Little Grebe	*Tachybaptus ruficollis*	1	13/09/2017	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Magpie	*Pica pica*	2	12/02/2021	
Mallard	*Anas platyrhynchos*	3	08/02/2018	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Moorhen	*Gallinula chloropus*	1	31/03/2024	
Mute Swan	*Cygnus olor*	2	13/11/2016	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Pied Wagtail	*Motacilla alba yarrellii*	1	12/02/2021	
Robin	*Erithacus rubecula*	5	12/02/2021	
Rook	*Corvus frugilegus*	2	01/01/2021	
Skylark	*Alauda arvensis*	2	28/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation

Common Name	Species Name	Count	Last Record	Conservation Status
				Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Song Thrush	*Turdus philomelos*	6	08/02/2018	
Spotted Flycatcher	*Muscicapa striata*	3	23/08/2019	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Starling	*Sturnus vulgaris*	2	22/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Swallow	*Hirundo rustica*	1	22/05/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Swift	*Apus apus*	2	18/07/2022	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Whitethroat	*Curruca communis*	1	19/05/2021	
Wren	*Troglodytes troglodytes*	3	12/02/2021	
Yellowhammer	*Emberiza citrinella*	7	07/09/2018	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

5.5.2 Non-Volant Mammals

The desktop review of available information obtained from the NBDC revealed the confirmed observation of 15 mammal species within the 4km^2 grid squares, including 6 bat species. NBDC for the two grid squares include records of Pine Martin and Grey Squirrel, both critically endangered mammals in Ireland. However, records of these species were last confirmed

in 2018 and 1981, respectively. Table 4.2 provides an overview of records of mammal sightings within the 2km grid squares O07M and O07S.

Table 5.2 Summary of Mammal Sighting Records within Grid Squares O07M and O07S, 1981 – 2025 (Yellow = records > 10 years old; Orange = records > 15 years old).

Common Name	Species Name	Count	Last Record	Conservation Status
American Mink	*Neovison vison*	1	01/03/2015	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Badger	*Meles meles*	5	30/07/2015	Protected Species: Wildlife Acts
Otter	*Lutra lutra*	2	16/09/2018	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Pine Marten	*Martes martes*	3	07/08/2018	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts
Grey Squirrel	*Sciurus carolinensis*	1	11/06/1981	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> EU Regulation No. 1143/2014 || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Hedgehog	*Erinaceus europaeus*	7	24/04/2022	Protected Species: Wildlife Acts
Irish Hare	*Lepus timidus subsp. hibernicus*	2	02/08/2018	
Rabbit	*Oryctolagus cuniculus*	2	07/02/2015	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> Medium Impact Invasive Species
Brown Long-eared Bat	*Plecotus auritus*	2	14/09/2017	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Common Pipistrelle	*Pipistrellus pipistrellus sensu stricto*	1	13/05/2003	

Common Name	Species Name	Count	Last Record	Conservation Status
Daubenton's Bat	*Myotis daubentonii*	1	13/09/2017	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Leisler's Bat	*Nyctalus leisleri*	6	13/09/2017	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Soprano Pipistrelle	*Pipistrellus pygmaeus*	10	14/09/2017	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	3	04/06/2015	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Red Deer	*Cervus elaphus*	1	15/06/2015	Protected Species: Wildlife Acts

5.6 Herpetofauna

The desktop review of available information obtained from the NBDC revealed the confirmed observation of two herpetofauna species within the 4km^2 grid squares. NBDC records for the two grid squares include common lizard and the invasive terrapin turtle. However, records of common lizard were last confirmed in 1974. Table 4.3 provides an overview of records of herpetofauna sightings within the 2km grid squares O07M and O07S.

Table 5.3 Summary of Herpetofauna Sighting Records within Grid Squares O07M and O07S (Yellow = records > 10 years old; Orange = records > 15 years old).

Common Name	Species Name	Count	Last Record	Conservation Status
Common Lizard	Zootoca vivipara	1	01/09/1974	Protected Species: Wildlife Acts
Slider Terrapins	Trachemys	1	24/03/2012	National Invasive Species Database

5.7 Fauna – *In-Situ* Surveys

5.7.1 Birds

A range of bird species were observed on and near the Proposed Development site between 2021 and 2025. Of note was the presence of two species of high conservation concern (i.e. Red-listed species), namely Meadow Pipit and Yellowhammer at and near the Proposed Development site during the breeding season surveys completed between 2022 and 2025.

A pair of buzzards were observed to be present within the general vicinity of the Proposed Development site, with a nest site being located to the north of the Proposed Development site (i.e., on the Northern bank of the River Boyne).

The red-listed breeding species Yellowhammer was confirmed to be present (via calls) within the northeastern portion of the Proposed Development site during the 2022 and 2025 in-situ surveys. Yellowhammer were identified within the linear woodland along the western portion of the development site in 2022 and was identified as probably breeding within boundary hedging during the 2022 breeding season. Yellowhammer were heard calling to the northeast of the Proposed Development site during the April 2025 survey. No Yellowhammer were seen or heard on site during the May 2025 bird survey. This species was heard calling and singing in the arable field to the south of the Proposed Development site, south of Rathmullan Road. Given the presence of Yellowhammer within the Proposed Development site during 2025, with one male recorded in suitable breeding habitat, this species is considered to be a possible breeder within the Proposed Development site for the 2025 breeding season.

Similarly, vocal calls of Meadow Pipit were heard in the southwest corner of the development site during the April 2025 and May 2025 survey. Both calls were fleeting with no Meadow Pipit observed singing or displaying on site during these surveys. No evidence of breeding Meadow Pipit within the boundaries of the Proposed Development site.

For all other bird species recorded on / near the Proposed Development site, the distribution of bird species was confined to the woodland along the western boundary, and the scrub and woodland along the Northeastern boundary of the site. Bird activity typically decreased along the Southern portion of the site, with Wren, Song Thrush and Blackbird being the only species recorded along the southern portion of the site. No ground nesting birds were flushed from arable land during transects through this habitat. Table 5-5, below, provides a summary of bird species confirmed to occur on / near the site during in-situ bird surveys (2021 – 2025).

Table 5.4 Overview of Bird Count Data Across the Various Surveys (2022 – 2025).

Common Name	Species Name	Survey Date	BoCCI Status
Blackbird	*Turdus merula*	May/June 2022	Green
Chaffinch	*Fringilla coelebs*	May/June 2022	Green
Chiffchaff	*Phylloscopus collybita*	May/June 2022	Green
Dunnock	*Prunella modularis*	May/June 2022	Green
Goldfinch	*Carduelis carduelis*	May/June 2022	Amber
Greenfinch	*Chloris chloris*	May/June 2022	Amber
Robin	*Erithacus rubecula*	May/June 2022	Green
Wren	*Troglodytes troglodytes*	May/June 2022	Green
Swallow	*Hirundo rustica*	May/June 2022	Amber
Wood pigeon	*Columba palumbus*	May/June 2022	N/A
Pheasant	*Phasianus colchicus*	May/June 2022	Green
Blue Tit	*Cyanistes caeruleus*	December 2024	Green

Common Name	Species Name	Survey Date	BoCCI Status
Black-headed Gull	*Chroicocephalus ridibundus*	December 2024	Amber
Buzzard	*Buteo buteo*	December 2024	Green
Cormorant	*Phalacrocorax carbo*	December 2024	Amber
Common Gull	*Larus canus*	December 2024	Amber
Hooded Crow	*Corvus cornix*	December 2024	Green
Robin	*Erithacus rubecula*	December 2024	Green
Rook	*Corvus frugilegus*	December 2024	Green
Starling	*Sturnus vulgaris*	December 2024	Green
Wood pigeon	*Columba palumbus*	December 2024	Green
Buzzard	*Buteo buteo*	April 2025	Amber
Meadow Pipit	*Anthus pratensis*	April 2025	Red
Yellowhammer	*Emberiza citrinella*	April 2025	Red
Herring Gull	*Larus argentatus*	April 2025	Amber
Swallow	*Hirundo rustica*	April 2025	Amber
Starling	*Sturnus vulgaris*	April 2025	Amber
Skylark	*Alauda arvensis*	April 2025	Amber
Willow warbler	*Phylloscopus trochilus*	April 2025	Amber
Goldcrest	*Regulus regulus*	April 2025	Amber
Wren	*Troglodytes troglodytes*	April 2025	Green
Blue tit	*Cyanistes caeruleus*	April 2025	Green
Great tit	*Parus major*	April 2025	Green
Blackcap	*Sylvia atricapilla*	April 2025	Green
Whitethroat	*Sylvia communis*	April 2025	Green
Blackbird	*Turdus merula*	April 2025	Green
Song thrush	*Turdus philomelos*	April 2025	Green
Chiffchaff	*Phylloscopus collybita*	April 2025	Green
Dunnock	*Prunella modularis*	April 2025	Green
Wood Pigeon	*Columba palumbus*	April 2025	Green
Magpie	*Pica pica*	April 2025	Green
Rook	*Corvus frugilegus*	April 2025	Green
Robin	*Erithacus rubecula*	April 2025	Green

5.7.2 Waterbird Surveys

Wintering wetland bird species such as golden plover, lapwing, greylag goose, herring gull and lesser-black backed gull as well as other waterbirds are known to rely on and / or opportunistically use grassland and arable land for feeding and roosting. These species generally prefer to use areas of open and expansive grassland and arable land for feeding and roosting (FAS, 2017) and are less associated with enclosed and small field sizes (Milsom et al. 1998).

Wintering waterbirds that forage on grassland habitats prefer short sward grassland, with the optimum height for species such as golden plover and lapwing reported to be around 7cm tall (Gillings & Fuller, 1999). Gregory (1987) found lapwing avoided habitats with swards more than 10cm in height, while Milsom *et al.* (1998) demonstrated that both golden plover and lapwing preferred to feed in fields that had been mown twice rather than once during the season and virtually avoided unmown fields. The sward conditions within the Proposed Development site during all surveys between January 2021 and February 2023 were representative of short sward winter stubble that provides suitable foraging habitat for these species.

The regular presence of buzzards over the Proposed Development site (observed during site visits in January, February, April, November, 2021; January 2022 and February 2023) is likely to undermine the likelihood of the Proposed Development site and surrounding area being used as a foraging habitat by waterbirds such as golden plover, lapwing or greylag goose.

During all surveys (2022 – 2025), no special conservation interest bird species of the Boyne Estuary SPA, River Boyne and River Blackwater SPA, or North-West Irish Sea SPA were observed foraging, roosting or loafing within the Proposed Development site or the surrounding area during all winter season surveys. No other waterbird species were recorded at the Proposed Development site during all surveys. In addition, no Kingfisher (the special conservation interest bird species of the River Boyne and River Blackwater SPA) were observed at the Proposed Development site during surveys. Kingfisher are commonly found along watercourses and along the banks of estuaries along steep banks and / or overhanging perches (NPWS, 2024; birds.ie, 2025. The River Boyne is located c. 50 m of the proposed development site, whilst the proposed development site does not exhibit any steep banks, overhanging perches or vantage points over watercourses that would provide supporting habitat for Kingfisher. Moreover, there are no supporting breeding habitats (i.e., mud banks or similar habitats) within the boundary of the proposed development site. Based upon the results of the field surveys, the Proposed Development site does not function as a terrestrial habitat relied upon by special conservation interest bird species or waterbirds of the above five listed SPAs.

5.8 Non-Volant Mammals

5.8.1 Badgers

Two mammal entrances, indicative of badger entrances and a badger sett were recorded within the woodland habitat on the north facing slope. One of the entrances is located within the Proposed Development site, whilst the other is located to the west of the Proposed Development site. The entrance within the Proposed Development site is situated at a

location in the woodland that is subject to informal recreational activity. No definitive evidence indicating the presence of badgers at this entrance was noted during the survey completed on survey dates between May and July 2022 and again during February 2023. Both entrances were sticked firmly with twigs to monitor the movement of mammal traffic in an out of the entrances. The sticks remained in-situ during the surveys between May and July, indicating an absence of mammal traffic in and out of the entrances. Based upon the results of the monitoring at these entrances in 2023, it was determined that the setts were representative of outlier/subsidiary setts for the local badger population. Aside from these sett entrances mammal tracks were noted within woodland habitat to the west and east of the Proposed Development site.

Continued ecological monitoring of the site has been completed between 2023 and August 2025. Between April and August 2025, the location and immediate surrounds of the previously identified badger setts location have been monitored by a qualified ecologist. These monthly ecological surveys have revealed no further evidence for the active use of the badger setts nor any evidence suggesting the regular / persistent movement of badger in the vicinity of the previously identified badger setts. Furthermore, monthly ecological surveys have revealed no evidence to suggest the persistent nor regular us of the site by badger.

5.8.2 Otters

The Proposed Development site does not provide nor offer suitable habitat for otters. However, the River Boyne to the north of the site is a known otter habitat.

A search of the south bank stretch of the River Boyne, located to the north of the Proposed Development site, during field surveys in January 2022, February 2023 and April 2025 did not reveal the presence of any holts or couches within riparian vegetation along the river.

Two mammal entrances were identified in the woodland habitat to the north of the Proposed Development site, between the Proposed Development site redline boundary and the Rathmullan Road. The entrances, indicative of badger setts, are located in an area that appears to be used as informal recreational / social space. However, no definitive evidence indicating the presence of badgers using these entrances in recent times was recorded during field surveys (2022 – 2025).

The presence of mammal entrances were not noted during previous surveys at the Proposed Development site (in 2018 and 2007). The non-native Fallow deer has previously been recorded within the Proposed Development site, whilst there are records for the presence of badger, grey squirrel, otter, pine marten, red deer, hare, stoat and hedgehog for the wider surrounding area.

5.9 Volant Mammals – Bats

5.9.1 Bat Roost Potential of Structures

Based on the Marnell et al. (2022) roost potential assessment criteria, Table 4.5 lists the principal structural features associated with structures in the vicinity of the Proposed Development site that are considered to influence roost potential of these structures.

The corrugated roof material used for the structures, along with the general dilapidated condition of these structures within large voids, draughty and bright interior conditions combine to result in these structures being unsuitable for supporting roosting bats and of low potential for roosting bats.

Table 5.5 Structural Features associated with On-Site Structures.

Factors Influencing Roost Potential	Effect on Roost Potential
Sheet metal roof	Decreased Potential
Dilapidated roof with high levels of light penetration and bright interior conditions during daytime	Decreased Potential
Interior of the structure generally not shaded from the sun	Decreased Potential

5.9.2 Roost Surveys

No signs of bat activity were recorded within the farm buildings at the farmyard complex towards the centre-east of the site or at the farm buildings further south and adjacent to the public road. No bats were observed emerging from structures at either farmyard during bat emergence surveys completed during the 2022 and 2024 seasons.

It is noted that a pair of bats were observed roosting at the lean-to concrete building at the eastern end of the farmyard immediately to the south of the Proposed Development site during a separate bat survey completed during the 2018 bat activity season. A pair of Common pipistrelles were also observed roosting within corrugated farm buildings at the farmyard further to the south and adjacent to the public road.

The roosting activity recorded during the 2018 bat surveys were adjudged to be representative of transitional or night-time roosts for Common pipistrelle. The buildings were considered to be of low suitability for maternity roosts or for hibernation roosts.

The results of the more recent surveys of 2022 and 2024 indicate that the structures on site do not function as roost sites for bats and are not used by the local bat population for roosting.

5.9.3 Manual Bat Detector Survey

Consistent Common pipistrelle foraging activity was recorded during both manual transects along the northern boundary of the Proposed Development site at the woodland edge and along the edge of the woodland and hedgerow within the Rathmullan Road "depression" along the eastern boundary of the site. Common pipistrelle foraging activity was also recorded during both transect surveys within the farmyard complex immediately to the south of the Proposed Development site boundary.

Leisler's bat and Soprano pipistrelle were also recorded during the manual survey, but these species were recorded at lower levels and the calls were fleeting indicative of commuting individuals as opposed to foraging activity.

5.9.4 Static Detector Monitoring

At least five bat species were recorded during bat surveys at the Proposed Development site. These species include Leisler's bat, Common pipistrelle, Soprano pipistrelle, brown long-eared bat and Myotis species. The number of bat passes per night per species recorded during static monitoring is provided in Table 4.6.

Table 5.6 Summary of Static Detector Bat Monitoring Results.

Date	MYOSPP	NYCLEI	PIPPIP	PIPPYG	PLEAUR	Total/Night
24/05/2022	0	1	13	2	0	**16**
25/05/2022	0	2	38	3	0	**43**
26/05/2022	0	3	498	4	0	**505**
27/05/2022	1	12	646	4	4	**667**
28/05/2022	0	22	516	17	0	**555**
29/05/2022	0	11	873	8	0	**892**
30/05/2022	0	21	263	12	0	**296**
31/05/2022	0	11	342	3	1	**357**
01/06/2022	0	3	335	5	0	**343**
02/06/2022	0	1	566	5	0	**572**
03/06/2022	0	26	643	24	2	**695**
04/06/2022	0	24	863	26	0	**913**
05/06/2022	0	21	630	29	1	**681**
06/06/2022	0	24	544	18	3	**589**
07/06/2022	0	3	202	6	0	**211**
08/06/2022	0	1	16	0	0	**17**
09/06/2022	0	2	128	3	0	**133**
10/06/2022	0	0	6	0	0	**6**
11/06/2022	1	1	249	7	5	**263**
12/06/2022	0	1	3	0	55	**59**
13/06/2022	0	5	588	12	33	**638**
14/06/2022	0	1	41	0	6	**48**

15/06/2022	0	1	450	2	4	**457**
16/06/2022	0	0	28	0	0	**28**
17/06/2022	1	43	507	11	2	**564**
18/06/2022	0	10	416	5	8	**439**
19/06/2022	0	47	162	6	1	**216**
20/06/2022	2	30	667	17	38	**754**
21/06/2022	0	43	561	35	26	**665**
22/06/2022	0	79	408	37	21	**545**
23/06/2022	0	25	875	14	70	**984**
24/06/2022	0	41	137	17	35	**230**
25/06/2022	0	13	877	12	12	**914**
26/06/2022	0	10	934	21	9	**974**
27/06/2022	0	14	498	21	10	**543**
28/06/2022	0	41	1387	13	55	**1496**
29/06/2022	0	34	363	8	153	**558**
30/06/2022	1	83	611	96	50	**841**
01/07/2022	0	109	659	46	56	**870**
02/07/2022	0	21	561	13	19	**614**
03/07/2022	0	16	1179	10	82	**1287**
04/07/2022	0	6	1179	12	82	**1279**
05/07/2022	0	47	796	28	234	**1105**
06/07/2022	0	24	22	1	72	**119**
07/07/2022	0	8	9		122	**139**
08/07/2022	0	3	965	11	12	**991**
09/07/2022	0	31	1212	21	171	**1435**
10/07/2022	1	21	1518	10	145	**1695**
Total/Species	**7**	**996**	**24984**	**655**	**1599**	**28241**

The evaluation of bat activity recorded during static monitoring surveys follows the approach outlined by Kepel (2011) who assigned bat activity based on bat passes per hour as follows:

- Pipistrelle species and Leisler's bat: Low = <3.5 passes per hour; Moderate = 3.6 – 6.5 passes per hour; High = >6.5 passes per hour
- All Other Bat species: Low = <4.0 passes per hour; 4.1 to 10 passes per hour; high = >10 passes per hour.

These categories are applied to the median bat pass per hour per night recorded during monitoring. The median bat pass per hour per night has been recommended by Lintott & Matthews (2018) as the most accurate representation of bat activity as bat activity levels between nights can be highly variable.

Based upon this approach the median bat pass per hour for the five bat taxa recorded during monitoring is provided in Table 4.7 below. The analysis of the monitoring shows that activity was low for Myotis species, Leisler's bat, Soprano

pipistrelle and brown long-eared bat. Bat activity was very high for Common pipistrelle with a median bat pass per hour of 73.1 passes recorded.

Table 5.7 Median Bat Pass / Hour and Bat Activity Categories.

Species	Myotis Species	NYCLEI	PIPPIP	PIPPYG	PLEAUR
Median Pass / Hour / Night	0.00	1.9	73.1	1.5	1.0
Bat Activity (as per Kepel)	Low	Low	High	Low	Low

The high levels of Common pipistrelle are not unexpected at the Proposed Development site given the presence of woodland and scrub habitats on site and the presence of woodland habitat and open grassland areas to the east of the Proposed Development site. Common pipistrelle bats are widespread and abundant in Ireland and are generally encountered during bat activity surveys (NPWS, 2019). Notwithstanding this it is noted that the activity levels recorded during the surveys were indicative of very high foraging activity. Based upon these results and the results of manual surveys completed at the Proposed Development site, the farmyard area and the sheltered Rathmullan Road corridor to the northeast of the farmyard represent preferred bat foraging habitat.

2024 Static Detector Monitoring Results

Four bat species were recorded during the 2024 bat surveys at the project site. These species include Leisler's bat, Common pipistrelle, Soprano pipistrelle, and brown long-eared bat. The number of bat passes per night per species recorded during static monitoring at monitoring point 1 and 2 are provided in Table 4.8.

Table 5.8 Summary of Static Detector Bat Monitoring Results at Monitoring Point 1.

Date	MYOSPP	NYCLEI	PIPPIP	PIPPYG	PLEAUR	Total/Night
20240625	0	7	533	16	2	558
20240626	0	20	15	3	3	41
20240627	0	13	24	0	0	37
20240628	0	27	361	35	2	425
20240629	0	5	225	67	0	297
20240630	0	11	146	43	0	200
20240701	0	10	185	13	0	208
20240702	0	30	391	146	1	568
20240703	0	3	112	3	0	118
20240704	0	26	109	21	0	156
20240705	0	19	266	60	0	345
20240706	0	18	407	47	0	472

20240707	0	0	76	2	0	78

Table 5.9 Summary of Static Detector Bat Monitoring Results at Monitoring Point 2.

Date	MYODAU	NYCLEI	PIPPIP	PIPPYG	PLEAUR	Total/Night
20240625	0	10	31	13	1	55
20240626	0	7	5	3	0	15
20240627	0	5	8	2	0	15
20240628	0	14	29	65	1	109
20240629	0	2	11	8	0	21
20240630	0	13	19	47	0	79
20240701	0	10	8	31	0	49
20240702	0	25	57	243	0	325
20240703	0	29	8	12	0	49
20240704	0	20	16	61	0	97
20240705	0	4	10	19	0	33
20240706	0	8	16	63	0	87
20240707	0	15	5	30	0	50

Based upon the Kepel approach for classifying bat activity levels the median bat pass per hour for the four bat taxa recorded during monitoring is provided in Table 4.9 below.

The analysis of the monitoring shows that activity was low for Myotis species, Leisler's bat, and brown long-eared bat. Bat activity was very high for Common pipistrelle at monitoring point 1 with a median bat pass per hour of 26.43 passes recorded. Activity for Common pipistrelle was low at monitoring point 2 indicating a concentration of foraging activity for this species in the vicinity of monitoring point 1. Bat activity for Soprano pipistrelle at monitoring point 1 was low, whilst it was medium at monitoring point 2.

Table 5.10 Median Bat Pass / Hour and Bat Activity Categories.

Species	Myotis Species	NYCLEI	PIPPIP	PIPPYG	PLEAUR
Median Pass / Hour / Night at MP1	0.00	1.86	26.43	3.00	0.00
Median Pass / Hour / Night at MP2	0.00	1.43	1.57	4.29	0.00

Species	Myotis Species	NYCLEI	PIPPIP	PIPPYG	PLEAUR
Bat Activity (as per Kepel)	Low	Low	High and Low	Low to Medium	Low

The high levels of Common pipistrelle are not unexpected at the Proposed Development site given the presence of woodland and scrub habitats on site and the presence of woodland habitat and open grassland areas to the east of the Proposed Development site. Common pipistrelle bats are widespread and abundant in Ireland and are generally encountered during bat activity surveys (NPWS, 2019). Notwithstanding this it is noted that the activity levels recorded during the surveys were indicative of very high foraging activity. Based upon these results and the results of manual surveys completed at the Proposed Development site, the farmyard area and the sheltered Rathmullan Road corridor to the northeast of the farmyard represent preferred bat foraging habitat.

5.10 European Sites

As noted in Section 1, five European Sites have been screened in for examination as part of this NIS. The features of interest of each of these European Sites are listed on Table 5.1, below, and those qualifying features of interest/special conservation interest that were identified during the screening as occurring within the zone of influence of the Proposed Development and requiring further examination as part of this NIS are identified.

Table 5.11 European Sites and Qualifying Interests.

European Sites	Qualifying Interest (QI)	QI to be examined and Rationale
River Boyne and River Blackwater SAC & Boyne River Islands pNHA	• Alkaline fens [7230] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] (to be referred to as Alluvial woodland) • River Lamprey (*Lampetra fluviatilis*) [1099] • Salmon (*Salmo salar*) [1106] • Otter (*Lutra lutra*) [1355]	• Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] (to be referred to as Alluvial woodland)* • River Lamprey *(Lampetra fluviatilis)* [1099] • Salmon *(Salmo salar)* [1106] • Otter *(Lutra lutra)* [1355] The qualifying habitat Alluvial woodland and the qualifying species of this SAC require further examination for adverse effects due to their proximity to the Proposed Development site or the presence of potential emission pathways connecting the Proposed Development site to these features of interest. There are no pathways connecting the Proposed Development site to Alluvial fen habitat and as such this habitat was screened out for the need for further examination.

Boyne Coast and Estuary SAC & Boyne Coast And Estuary pNHA	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] (referred to as tidal mudflats and sandflats) • Salicornia and other annuals colonising mud and sand [1310] (referred to as Salicornia mud) • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] (referred to as Atlantic salt meadows • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] (referred Marram dunes) • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] (to be referred to as Fixed dunes)	• Estuaries [1130] • Tidal mudflats and sandflats [1140] • Salicornia mud [1310] • Atlantic salt meadows [1330] The five qualifying habitats require further examination for adverse effects due to the presence of potential emission pathways, in the form of a hydrological pathway connecting the Proposed Development site to these features of interest. The other qualifying habitats of this SAC are not connected to the Proposed Development site via hydrological pathways or any other potential pathways and as such these habitats were screened out for the need for further examination.
River Boyne and River Blackwater SPA	• Kingfisher *(Alcedo atthis)* [A229]	• Kingfisher *(Alcedo atthis)* [A229] This species requires further examination for adverse effects due to its proximity to the Proposed Development site or the presence of potential emission pathways connecting the Proposed Development site to these features of interest.
Boyne Estuary SPA	• Shelduck (Tadorna tadorna) [A048] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Lapwing (*Vanellus vanellus*) [A142] • Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144]	• Golden Plover *(Pluvialis apricaria)* [A140] • Lapwing *(Vanellus vanellus)* [A142] These species are representative of terrestrial waders as identified by the NPWS (2012b). They use terrestrial habitat for foraging, particularly during high tide when coastal intertidal foraging habitats are inundated. Suitable foraging habitat for these species occurs at the Proposed Development site and the Proposed Development site is located within the mean core foraging range of these species (as defined by SNH

	• Black-tailed Godwit (*Limosa limosa*) [A156] • Redshank (*Tringa totanus*) [A162] • Turnstone (*Arenaria interpres*) [A169] • Little Tern (*Sterna albifrons*) [A195] • Wetland and Waterbirds [A999]	(2016)). As such these species were screened for further examination.
North-West Irish Sea SPA	• Red-throated Diver (*Gavia stellata*) [A001] • Great Northern Diver (*Gavia immer*) [A003] • Fulmar (*Fulmarus glacialis*) [A009] • Manx Shearwater (*Puffinus puffinus*) [A013] • Cormorant (*Phalacrocorax carbo*) [A017] • Shag (*Phalacrocorax aristotelis*) [A018] • Common Scoter (*Melanitta nigra*) [A065] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Lesser Black-backed Gull (*Larus fuscus*) [A183] • Herring Gull (*Larus argentatus*) [A184] • Great Black-backed Gull (*Larus marinus*) [A187] • Kittiwake (*Rissa tridactyla*) [A188] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194]	• Herring Gull (*Larus argentatus*) [A184] Herring Gull are representative of terrestrial waders as identified by the NPWS (2012b). They use terrestrial habitat for foraging, particularly during high tide when coastal intertidal foraging habitats are inundated. Herring gull are also known to use terrestrial habitats for foraging. Suitable foraging habitat for these species occurs at the Proposed Development site and the Proposed Development site is located within the mean core foraging range of these species (as defined by SNH (2016). As such these species were screened for further examination. All other species do not rely on agricultural lands and/or their mean core foraging range does not overlap with the Proposed Development site.

	• Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200] • Puffin (*Fratercula arctica*) [A204] • Little Gull (*Hydrocoloeus minutus*) [A862] • Little Tern (*Sternula albifrons*) [A885*]*	

6 CONSIDERATON OF POTENTIAL IMPACTS TO EUROPEAN SITES

The following pathways that have been identified as having the potential to give rise to adverse effects to European Sites relate to:

- Hydrological pathways arising from surface water and groundwater emissions.
- Noise emissions arising from construction phase works.
- Air emissions arising from construction phase works.
- Mobile species pathways, where the Proposed Development site was identified as supporting suitable habitat for special conservation interest bird species of SPAs listed in Section 1.0 above.
- Human distance pathways, where the operation phase of the Proposed Development will result in an increase in the human population in close proximity to the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA, with potential consequences for relevant qualifying species of interest of these two European Sites, namely otters and kingfisher.

The examination of potential adverse effects associated with these pathways is provided in the following subsections below.

6.1 Examination of Hydrological Pathway

The potential impacts that may arise as a result of the Proposed Development relate to the discharge of contaminated surface water from the Proposed Development site during the construction phase and operation phase to the River Boyne and Estuaries European Sites.

Earthworks associated with the construction phase of the Proposed Development will denude surfaces and have the potential to generate silt-laden surface water runoff from the Proposed Development site. In the event that water generated at the construction footprint is of a poor water quality standard or becomes contaminated from construction works, its discharge will have the potential to result in the release of polluted surface water to the main channel of the River Boyne. In addition, potentially contaminating materials such as oils, fuels, lubricants, other construction related solutions and cement-based products will be used on site during the construction phase and the accidental emission of such material via surface water runoff or groundwater base flows to the River Boyne will have the potential to undermine water quality within the river and contribute to existing water quality pressures to the transitional waters of the River Boyne and the River Boyne Estuary.

During the operation phase surface water generated at the Proposed Development site will discharge via the proposed surface water pathway to the River Boyne. The potential will exist for surface water runoff from car parking areas to be contaminated in the event of fuel leaks or accidental spills. Any untreated discharge of contaminated surface water runoff from the Proposed Development site to the River Boyne could contribute to existing pressures to water quality within the Boyne River and Estuaries European Sites.

It must be noted that the uncontrolled release of contaminated surface drainage waters to the River Boyne from the proposed development site is highly unlikely (when considering required maintenance and inherent construction works protocols/guidelines). In the unexpected event of a contaminant spill, a significant dilution effect is afforded by the River Boyne. Nonetheless, the deposition of moderate to high volumes of contaminants, such as hydrocarbons or cement material, to the lotic habitats and intertidal habitats further downstream could result in the contamination of benthic fauna and epifauna which function as a prey resource of freshwater qualifying fish species and the wetland bird species of the Boyne Estuary SPA. The toxic effect of such contaminants, particularly hydrocarbons, on feeding, growth, development and reproduction are known to cascade and bioaccumulate throughout the food chain affecting benthic fauna, fish, birds, including kingfisher and mammal, including otters (Ferrando, 2015).

In the unexpected, and unlikely uncontrolled release of contaminants from the Proposed Development site to the River Boyne, downstream to intertidal habitats of the Boyne Estuary, significant impacts to habitats and associated fauna within will depend upon the frequency of the release and the concentration of contaminating materials in surface water discharging from the site. In a worst-case scenario the ongoing discharge of waters with high concentrations of contaminating substances could over time lead to the deposition of such contaminants in lotic and wetland intertidal habitats. Revitt et al. (2014) demonstrated the potential of car parking areas to result in a build-up of diffuse pollution loads on their surfaces with subsequent mobilization and direct discharge to receiving waters. In the absence of appropriate design safeguards (such as the inclusion of attenuation and hydrocarbon interceptors) the discharge of such contaminated surface water from the Proposed Development site during the operation phase could represent a source of ongoing contamination to surface drainage waters being discharged to the River Boyne. Accidental spillages of contaminating materials during the operation phase could also represent sources of acute pollution to these watercourses.

The exposure of lotic and estuarine fauna, including fish, birds and mammals, to such contaminants can result in disturbance and stress effects. Upon detection of such contaminants mobile species such as fish, kingfishers and wetland birds or otters may simply move away from the affected area, with the potential to result in a decline in the distribution of these species within the Boyne River and Estuaries European Sites. For sessile benthic fauna, upon which the freshwater qualifying fish species of the SAC and many of the wetland bird species of the SPA rely, there will be no potential for escape and their exposure to contaminants may result in biological changes designed to aid survival. In some cases, these benthic species may acclimatise to contaminated conditions, while in others the contaminants may lead to mortality and changes in the population and community structure of intertidal wetland habitats. Such an effect would have the potential to undermine the conservation status of lotic and wetland habitats occurring downstream of the project, with consequent effects on qualifying species such as Atlantic salmon, lamprey species, kingfishers, otters and wetland bird species further downstream at the Boyne Estuary SPA.

6.2 Examination of Potential Noise & Vibration Disturbance to Waterbirds

The potential noise impact of construction and operational phase activities of projects to disturbance of kingfisher and otters, which are the species that have been identified as being susceptible to such disturbance. Their susceptibility to such disturbance has been identified on the basis of the proximity of the Proposed Development to the River Boyne and the sections of the river that are likely to be used by these species and the potential for noise to be generated during the construction phase.

The River Boyne is located within 40m of the Proposed Development site boundary. It is set back from the developable footprint of the Proposed Development site by approximately 135m. A noise impact assessment was completed for the Proposed Development site which examined the potential for noise impacts to surrounding receptors associated with construction works. This assessment found that no significant impacts relating to changes in noise levels would occur within 50m of the construction footprint.

Cutts et al. (2013) published the Waterbird Disturbance Toolkit for examining the potential disturbance effect of construction noise to waterbirds. This toolkit provides a calculation table for determining the distance at which a noise emitting source will reach non-disturbing acceptable levels. The item of plant associated with the construction phase that will have the highest emitting noise level will be a concrete breaker at 92 dB LAeq (10m from source). Using the Cutts et al. (2013) toolkit the distance at which this noise will be within an acceptable dose level will be approximately 20m.

Nature Scotland published a review of disturbance distance for bird species (Nature Scotland, 2022) and have identified a disturbance distance of 50m to 100m during both the non-breeding season and breeding season for kingfisher.

The National Road Association (NRA) guidance document Guidelines for The Treatment of Otters Prior To The Construction of National Road Schemes sets out the zones at which otters are disturbed by construction activity. This guideline notes that otter holts at which breeding females or cubs are present are at risk of disturbance from construction works, where such works are located within 150m of such a holt. The guideline also notes that any works within 20m of an active but non-breeding holt can result in disturbance to otters and that any light works such as digging by hand or scrub clearance within 15m of an otter holt can result in disturbance to otters. Given that there are no otter holts or couches occurring within 150m of the works, there will be no potential for the Proposed Development to result in disturbance to otters. Other publications relating to otters also note that this species, away from holt sites, is not sensitive to human disturbance (NPWS, 2009; NPWS, 2021).

It is subsequently concluded that noise and vibration generated during the construction phase will not have the potential to result in disturbance to the otter and kingfisher populations of the River Boyne, and that there is no functional noise/vibration impact pathway connecting the Proposed Development site to these features of interest of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA.

6.3 Examination of Potential Air Emissions

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust and PM10/PM2.5 emissions. Transport Infrastructure Ireland (TII) (2011) provide guidance for the potential distance for significant effects associated with such emissions to air. This guideline specifies distances according to the scale of a project, which ranges from major (Large construction sites, with high use of haul roads), to moderate (Moderate sized construction sites, with moderate use of haul roads), to minor (Minor construction sites, with limited use of haul roads). For the purposes of this examination a worst-case scenario is adopted with distances associated with a major development being used as part of the examination.

For a major development, the TII guidelines specify a potential distance for significant effects as associated with soiling, PM10 and Vegetation Effects at 100m, 25m and 25m, respectively. The boundary of the River Boyne and River Blackwater SAC is located within 100m of the construction footprint and will therefore be susceptible to soiling from dust emissions. However, it is noted that no qualifying habitats or habitats that are relied upon by qualifying species are located within this distance of the SAC. As such these qualifying features of interest of the River Boyne and River Blackwater SAC and the habitat used by kingfisher will not be affected by air emissions during the construction phase. Notwithstanding this, mitigation measures for avoiding any potential dust soiling impacts to all areas within the River Boyne and River Blackwater SAC are set out in Section 7 below.

In light of the above it is concluded that the operation phase of the Proposed Development will not have the potential to result in a function air impact pathway between the Proposed Development site and the River Boyne European Sites.

6.4 Examination of Mobile Species Pathway / Ex-Situ Habitat Examination

Targeted field surveys were completed (2021 – 2025) at and surrounding the Proposed Development to identify whether or not mobile qualifying species of surrounding SACs and SPAs rely on the Proposed Development and whether or not the Proposed Development represent an ex-situ habitat for these species. The species for which surveys were completed comprise otters, kingfisher and a wetland/waterbird species.

No otters or kingfisher were recorded on site during these field surveys and no suitable habitat for these species occurs at the Proposed Development site. Similarly, no wetland birds or waterbirds such as golden plover, lapwing, greylag goose, herring gull, or lesser-black backed gull, or any other wetland/waterbirds were recorded using the Proposed Development site as a foraging, roosting or loafing site during all bird surveys as detailed in Section 4 above.

In light of the targeted surveys completed at the Proposed Development site it can be concluded beyond reasonable scientific doubt, based on the best available scientific knowledge including the extensive bird surveys carried out on site, that the Proposed Development site does not function as an *ex-situ* habitat for these species and there is no mobile species pathway connecting the Proposed Development to SACs and SPAs in the wider surrounding area. The following

European Sites were screened in for further examination as part of this NIS due to the potential for a mobile species pathway to connect the Proposed Development to them:

- River Boyne and River Blackwater SAC
- River Boyne and River Blackwater SPA
- Boyne Estuary SPA
- North-West Irish Sea SPA

Given the absence of a mobile species pathway between the Proposed Development site and these SPAs there will be no potential for the Proposed Development to result in adverse effects to these four European Sites.

6.5 Examination of Human Disturbance Pathway

The operation phase of the Proposed Development will result in an increase in the human population at the Proposed Development site and in close proximity to the River Boyne. An existing recreational greenway facility is provided along the southern bank of the River Boyne, parallel to the Rathmullan Road. It is likely that this facility will be used as a recreational walking and cycling facility by residents of the Proposed Development during it operation phase.

This greenway facility was subject to a previous planning application, which included a NIS and an Appropriate Assessment completed by the competent authority. The Appropriate Assessment for this greenway concluded that its operation phase would not have the potential to result in adverse effects, alone or in-combination with other plans or projects, to the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA or any other European Sites occurring downstream at the Boyne Estuary. Given the Appropriate Assessment determination for this greenway project it is concluded that the use of this greenway by residents of the Proposed Development will not have the potential to result in adverse effects to the River Boyne and the associated European Sites or the Boyne Estuary European Sites downstream.

As noted in Section 4.1.4 above informal recreational use of the oak-ash-hazel woodland on the slopes to the north of the Proposed Development site was recorded during field surveys. Whilst this woodland habitat does not represent a qualifying habitat of the SAC it is located within the boundary of the SAC. An increase in the human population in the vicinity of this woodland could result in a further recreational pressure within this woodland habitat. As such mitigation measures to control the use of this woodland by future occupants have been prepared as part of the landscape masterplan and are set out in Section 7 below.

6.6 Cumulative Effects

The potential exists for the Proposed Development to overlap with other construction projects within the Boyne catchment downstream of the Proposed Development site. A review of the Meath and Louth County Council planning portal was completed to identify other recently approved or live planning applications, with which the Proposed Development could combine to result in negative effects to the water quality of the River Boyne and adverse effects to

the conservation status of the qualifying feature of interest/special conservation interests of the Boyne River and Estuaries European Sites. A number of planning applications were identified between the Proposed Development site and the Boyne Estuary in the immediate vicinity of the River Boyne corridor. However, the majority of these planning applications relate to minor projects associated with changes to existing dwellings or commercial buildings. Such projects are of a small scale and are not considered to present a risk of likely significant effects, alone or in-combination with other plans or projects, the Boyne River and Estuaries European Sites. This consideration is supported by the findings of the Local Authority Planners who state in the planners reports for such projects that there will be no risk of likely significant effects to European Sites. Given the above such projects are not itemised in this section. As such only six larger scale projects were identified as occurring in the vicinity of or downstream of the Proposed Development site along the River Boyne corridors. These projects are listed below and the potential for the Proposed Development to combine with these projects is also examined.

Table 6.1. Summary of Approved Planning Application Proximal to the Proposed Development.

Application Ref / Application Status	Description	Assessment
221718 / Approved (conditional)	The Proposed Development will consist of an update of the existing Drybridge to Platin 110 kV Overhead line (OHL) {approximately 5.6 km long and comprising 33no. structures (excluding LCIM 13a and LCIM 14 which are consented under separate planning application) and 2no. gantries between the existing Drybridge 110 kV substation in the townland of Tullyallen, Co. Louth and the existing Platin 110kV substation in the townland of Platin, Co. Meath). The proposed uprate development will comprise: 1) the replacement ("restringing") of the existing overhead line circuit conductor wires with a new higher capacity conductor including installation of a new fibre communication connection, 2) the replacement of 11 No. existing polesets (including 1 No. wooden poleset conversion from strain to suspension poleset structure} and S No towers (4 No steel angle masts and 1 No. steel end mast in Platin 110kV substation, 3) replacement and reorientation of steel end mast in Platin 110kV substation, 4) replacement of gantry in Drybridge 110kV substation, 5) foundation strengthening works at 1 No. steel angle mast, 6) the replacement of steel members at	This project will traverse over lands to the South and traversing the landscape to the Northwest of the proposed LRD (this project), and primarily encompasses the installation of replacement infrastructure to support the national electrical grid. A NIS has been prepared for the project. The NIS has concluded that, provided all mitigation measures are implemented, this project will not, alone or in-combination with other plans or projects, have the potential to result in adverse effects to the River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA or any other European Sites. Consequently, the replacement of national electrical infrastructure will not have the potential to combine with the Proposed Development to result in cumulative negative effects to the water quality of the River Boyne or

Application Ref / Application Status	Description	Assessment
	3 No. steel angle masts, 7) painting of all steel members at 2 No. steel angle masts, 8) replacement of hardware and fittings at all structure locations, 9) replacement and relocation of fibre communication structures	adversely affect the integrity of the River Boyne and Estuary European Sites.
2460345 / Approved (conditional)	Permission for the construction of a part single-storey, part two-storey sports facility including a General Purpose Sports Hall, a boxing arena, a fitness suite, social areas, changing rooms, circulation areas, administration areas, stores, service areas and other ancillary accommodation.	The planning application development is located c. 780m East of the proposed LRD (this development). Construction works will occur within an already developed residential property similarly surrounded by various commercial and residential developments. Moreover, there are no watercourses on/proximal to the planning application site. Consequently, it is determined that there is low/no potential for in-combination effects with the LRD (this development) through surface water, noise & vibration or dust effects.
2460266 / Approved (conditional)	The LRD application seeks modifications to the permitted SHD (ABP-311678-21, as amended under P.A. Ref. 2360368) and the application relates to 207no. of the 237no. permitted dwellings and the construction of the crèche as a standalone building (crèche is permitted as integral part of one of the apartment buildings in the permitted development). The modifications proposed do not affect the 30no. permitted dwellings currently under construction (Amendment permission P.A. Ref. 2360368) other than a minor boundary adjustment to the garden boundary of No. 30. The modifications provide for amendments to the design, layout and dwelling types including the omission of two permitted apartment buildings (111no. apartments) with associated modifications to the road layout and distribution of public open space, car parking, site services and site development works including the	This planning application development is located c. 770m North of the proposed LRD (this project). A small watercourse traverses along the Eastern boundary of the application site which ultimately flows into the River Boyne c. 900 m downstream from the site. A NIS has been prepared for the planning application, which has concluded that, provided all mitigation measures are implemented, this project will not, alone or in-combination with other plans or projects, have the potential to result in adverse effects to the River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA or any other European Sites. Consequently, it is concluded that this planning application

Application Ref / Application Status	Description	Assessment
	undergrounding of ESB overhead lines and associated diversion works. The 207no. new house types and apartments proposed have a residential mix of 21no. 1-bed, 49no. 2-bed, 115no. 3-bed & 22no. 4-bed, two and three storey in height in detached, semi-detached and terraced formats. The overall number of dwellings as permitted under the SHD (ABP-311678-21, as amended under P.A. Ref. 2360368) will remain unchanged at 237no. dwellings. The overall permitted dwelling mix will change from 147no. apartments and 90no. houses, to 42no. apartments and 195no. houses. The mix of dwellings within the entire SHD site will be amended from 19no. 1-bed, 96no. 2-bed, 109no. 3-bed and 13no. 4-bed (as permitted under ABP-311678-21 and amended under P.A. Ref. 2360368), to 21no. 1-bed, 49no. 2-bed, 142no. 3-bed and 25no. 4-bed. This planning application also seeks permission for 2no. ESB substations required to serve the proposed development. This planning application will be accompanied by a NIS	will not have the potential to combine with the Proposed Development to result in cumulative negative effects to the water quality of the River Boyne or adversely affect the integrity of the River Boyne and Estuary European Sites.

With regard to the existing threats and pressures to the relevant European Sites, as documented by the NPWS in their European Standard Data Return Forms and referred to in Section 4 above, it is noted that the majority of these threats/pressures are not related to any activities that will arise during the construction phase or operation phase of the Proposed Development and that the Proposed Development does not have any potential to result in activities that could exacerbate the risks posed by the majority of the threats and pressures listed for each of the SACs and SPAs above. However, the existing threats and pressures to the relevant European Sites that are of relevance to the Proposed Development as the Proposed Development could potentially combine with these to result in adverse cumulative effects are:

- H01 - Pollution to surface waters (limnic, terrestrial, marine & brackish)
- J02.11 - Siltation rate changes, dumping, depositing of dredged deposits
- E05 - Storage of materials
- E03.04 - Other discharges
- E01 - Urbanised areas, human habitation

In the absence of appropriate design and mitigation measures the Proposed Development will have the potential to combine with these existing threats and pressures to result in adverse cumulative effects to the Boyne River and Estuaries European Sites.

6.7 Consideration of Potential Impacts to Conservation Objectives

An NIS is required to assess the potential for impacts to the integrity of a European Site, with respect to the site's structure and function and its Conservation Objectives. The structural and functional elements of a European Site to maintain the favourable conservation status of qualifying features of interest/special conservation interests are embedded into the list of detailed site specific conservation objectives (SSCOs) for each of the site's interest features. As such a European Sites's SSCOs represent the parameters against which a project's potential to adversely affect the integrity of a European Sites should be considered.

Where SSCOs have not been published for some of the European Sites (i.e. the River Boyne and River Blackwater SPA) that are assessed as part of this NIS, site-specific conservation objectives for these same qualifying features of interest are taken from those published for other European Sites. Kingfisher is listed as a special conservation interest for two SPAs in Ireland, the River Boyne and River Blackwater SPA, and the River Nore SPA. However, no detailed Conservation Objectives have been published for kingfishers for either of these SPAs. In order to assess the Proposed Development against detailed Conservation Objectives, the published Conservation Objectives for other wetland bird species, resident in Ireland were used. Conservation Objectives for cormorant were selected to be used as part of this assessment. It is acknowledged that the ecology of cormorant and kingfisher differ significantly, however due to the residence of both species in Ireland during both the breeding and non-breeding season, the fact that both rely on a similar foraging resource (mainly fish species) and that no Conservation Objectives are published for any other bird species with a more similar ecology to kingfisher, published Conservation Objectives for cormorant have been used. The Conservation Objectives used for kingfisher in this assessment have been taken from River Shannon and River Fergus Estuaries SPA (004077) for breeding cormorant and Castlemaine Harbour SPA for non-breeding cormorant. The use of conservation objectives for kingfisher and cormorant only consider those conservation objectives that may be applicable and appropriate to ensure the preservation of local and regional biodiversity goals. For example, only broad overarching conservation objectives, such as access to suitable foraging habitat, preservation of waterway traversing habitat, and water quality maintenance to ensure support habitat for suitable aquatic forage species, have been cross-applied. Site specific conservation objectives, such as maintenance of core foraging / breeding habitat size, which is calculated based on data from the River Shannon and River Fergus Estuary SPA, has been omitted for the cross-application purposes.

A detailed table of the Conservation Objectives attributes and targets for each of the qualifying features of interest/special conservation interests of the Boyne River and Estuaries European Sites is provided in Appendix A. This table examines the potential for the Proposed Development to result in adverse effects to these attributes and targets. It is noted that the appraisal has been completed without any regard to the mitigation measures that will be implemented as part of the project. Appropriate mitigation measures are considered later in Section 7 below.

7 DESCRIPTION AND EVALUATION OF MITIGATION MEASURES

Targeted mitigation measures are outlined in this section to ensure that adverse effects to the qualifying features of interest and special conservation interests of the River Boyne and Estuaries European Sites as listed in Table 6.2 (see Appendix A) are avoided during the construction phase and operation phase of the project.

7.1 Construction Phase Mitigation Measures

The mitigation measures outlined hereunder are based on established best practice guidelines and will provide effective screening of the Proposed Development for likely effects to habitats, species and associated key ecological receptors generated during the construction phase and operational phases of the Proposed Development. Mitigation measures and environmental safeguards outlined for the construction phase are taken from established best practice guidelines that have been successfully implemented for a wide range of project-level infrastructural developments. These recommended mitigation measures have undergone extensive and rigorous monitoring for their effectiveness at development sites where they have previously been applied to ensure beyond reasonable scientific doubt that there will be not be adverse effect stemming from the Proposed Development.

It has been concluded beyond reasonable scientific doubt that, provided all mitigation measures that aim to avoid the discharge of contaminated surface drainage waters are implemented, the potential for negative impacts to water quality and associated adverse effects to qualifying features of interest along the River Boyne and downstream at the Boyne Estuary will be eliminated. This in turn will eliminate the potential for adverse effects to the conservation objectives and integrity of the River Boyne and Estuaries European Sites. The mitigation measures will also eliminate the risk of the proposed development impacting upon the environment via all other pathways, including air and human disturbance.

The best practice guidance that has informed the mitigation measures herein and the proposed environmental safeguards that should be adhered to throughout the construction and operational phases of the Proposed Development (as recommended by the EA / SEPA / EHS) include:

- PPG 1: Understanding your environmental responsibilities - good environmental practices
- GPP 2: Above ground oil storage tanks
- PPG 3: Use and design of oil separators in surface water drainage systems
- GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer
- GPP 5: Works and maintenance in or near water
- PPG 6: Working at construction and demolition sites
- PPG 7: Safe storage - The safe operation of refuelling facilities
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 8: Safe storage and disposal of used oils
- GPP 19: Vehicles: Service and Repair
- GPP 21: Pollution incident response planning
- GPP 22: Dealing with spills

- GPP 26 Safe storage - drums and intermediate bulk containers
- PPG 27: Installation, decommissioning and removal of underground storage tanks
- CIRIA Environmental Good Practice on Site

7.1.1 Mitigation Measures: Surface Water Quality

The potential for the construction phase of the Proposed Development to result in the discharge of polluted surface water to the River Boyne has been identified as a potential impact pathway that could result in adverse effects to the River Boyne and Estuaries European Sites.

In order to minimise the generation of polluted waters in the first instance and avoid the discharge of polluted surface water to the River Boyne the following measures will be implemented:

- The main contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- Surface water catch-trenches will be provided along the northern, western and eastern boundary of the construction footprint prior to stripping topsoil. The surface water catch-trenches will have a settlement pond silt trap at the end of each trench with an overflow. The surface water catch-trenches will be discharged via a buffered outfall overland to the north of the site. Straw bales will be placed within the catch-trenches at strategic locations and at the outfall of the settlement ponds to the overflow. These measures will be implemented and maintained during the construction phase to prevent surface water runoff from discharging directly into the local water course. An indicative layout for the proposed surface water catch-trenches is set out in Appendix A of the CEMP for the proposed development, provided under separate cover with the planning application documentation.
- A clean water diversion drain will be provided for in advance of the stripping of topsoil. The clean water diversion drain will be provided to the south and up-gradient of the construction footprint. This will divert surface water runoff overland from areas to the south and upgradient of the construction footprint away from this footprint, thereby minimising the volume of runoff occurring within this footprint.
- A silt fence will be installed in accordance with CIRIA guidelines along the western, northern and eastern boundary of the construction footprint. The provision of the silt fence, particularly along the northern and eastern boundary of the construction footprint will eliminate the potential for the untreated release of silt-laden surface water from the Proposed Development site north towards the River Boyne or east towards the culverted section of the Sheephouse Stream.
- Settlement ponds/silt traps as outlined above will be provided to prevent silt runoff into the existing ditches/watercourses during the drainage works.
- Regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location will be agreed between the project ecologist and the site foreman at the commencement of works. Trigger levels for halting works and re-examining protection measures will be pH >9.0 or pH <6.0; and/or suspended solids >25

mg/l. These trigger levels are based on those outlined within 'Guidelines on Protection of Fisheries During Works in and Adjacent to Waters (IFI, 2016).

- In the unlikely and unexpected event that silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.
- All fuels and chemicals will be bunded, and where applicable, stored within double skinned tanks / containers with the capacity to hold 110% of the volume of chemicals and fuels contents. Bunds will be located on flat ground a minimum distance of 50m from any watercourse or other water conducting features, including the cut off trenches. This will prevent the discharge of such substances to ground and eliminate the potential for groundwater base flow contamination with such substances.
- Any re-fuelling and maintenance of equipment will be done at designated bunded areas with full attendance of plant operative(s) within contained areas at least 50m from any surface water drain to be provided on site as part of the construction phase drainage management. Re-fuelling in such areas will prevent the discharge of such substances to ground and eliminate the potential for groundwater base flow contamination with such substances.
- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position is accurately identified before excavation works commence.
- Spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water.
- A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe disposal of any contaminated water.
- Temporary traffic management will be implemented as appropriate during the construction of the outfalls on Rathmullan/River Road.

7.1.2 Best Practice Measures to Control Noise Emissions

Whilst this NIS found no functional noise impact pathway connecting the Proposed Development site to European Sites, a series of best practices will be implemented to control noise emissions during the construction phase. The scheme contractor will be obliged to give due regard to BS5228, which offers detailed guidance on the control of noise from construction activities. In particular, it is proposed that various practices be adopted during construction, including:

- The provision of site hoarding along the western boundary of the Proposed Development site so that a barrier for noise emissions from the Proposed Development site to the west is in place. The site hoarding will be installed at the start of the construction phase.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Establishing channels of communication between the contractor/developer, local authority and residents.
- Appointing a site representative responsible for matters relating to noise.
- Ensuring all site access roads are kept as even as possible so as to mitigate the potential for vibration from lorries.
- Monitoring typical levels of noise during critical periods at sensitive locations.

Furthermore, it is necessary for a variety of practicable noise control measures to be employed as follows:

- Selection of plant with low inherent potential for generation of noise.
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints.

7.1.3 Mitigation Measures: Dust & Soiling

The construction phase has been identified as having the potential to generate soiling and dust within a potential 100m buffer zone surrounding the construction footprint. This includes the area of oak-ash-hazel woodland to the north of the construction footprint, which is located within the boundary of the River Boyne and River Blackwater SAC. In order to prevent soiling and adverse effects to vegetation the main contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site are adequately controlled and are within acceptable limits through use of the prevention and mitigation measures set out herein.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming air borne, since suppression is virtually impossible once it has become air borne.

The following are techniques and methods which are widely used currently throughout the construction industry, and which shall be used in the construction of the proposed development, where appropriate:

- The roads around the site are all surfaced, and no dust is anticipated arising from unsealed surfaces.
- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20kph.
- A regime of 'wet' road sweeping will be set up to ensure the roads around the immediate site are as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
- Footpaths immediately around the site will be cleaned by hand regularly, with damping, as necessary.
- High level walkways and surfaces such as scaffolding shall be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
- Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
- Vehicle and wheel washing facilities will be provided at site exit(s) where practicable. If necessary, vehicles shall be washed down before exiting the site.
- Netting will be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new buildings.
- Vehicles and equipment shall not emit black smoke from exhaust system, except during ignition at start up.
- Servicing of vehicles and plant shall be carried out regularly, rather than just following breakdowns.
- Internal combustion plant shall not be left running unnecessarily.

- Exhaust direction and heights shall be such so as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.
- Where possible fixed plant such as generators shall be located away from residential areas.
- The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
- The transport of dusty materials and aggregates shall be carried out using covered / sheeted lorries.
- Material handling areas shall be clean, tidy and free from dust.
- Vehicle loading shall be dampened down and drop heights for material to be kept to a minimum.
- Drop heights for chutes / skips shall be kept to a minimum.
- Dust dispersal over the site boundary shall be minimised using static sprinklers or other watering methods, as necessary.
- Stockpiles of materials shall be kept to a minimum and if necessary, they shall be kept away from sensitive receptors such as residential areas etc.
- Stockpiles where necessary, shall be sheeted or watered down.
- Methods and equipment shall be in place for immediate clean-up of spillages of dusty material.
- No burning of materials will be permitted on site.
- Earthworks excavations shall be kept damp where necessary and where reasonably practicable.
- Cutting on site shall be avoided where possible by using pre-fabrication methods.
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, shall be employed.
- Where scabbling is to be employed, tools shall be fitted with dust bags, residual dust shall be vacuumed up rather than swept away, and areas to be scabbled shall be screened off.
- Wet processes shall be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
- Where possible pre-mixed plasters and masonry compounds shall be used to minimise, dust arising from onsite mixing.
- Prior to commencement, the main contractor shall identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions, utilising the methods highlighted above. Furthermore, the main contractor shall prepare environmental risk assessments for all dust generating processes, which are envisaged.
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board shall also include head/regional office contact details.

The contractor will be obliged to implement the mitigation measures outlined above in respect of dust/dirt control.

7.1.4 Mitigation Measures: Minimise Disturbance to Oak-Ash-Hazel Woodland

All hedgerows and immature woodland marked for retention will be fenced off at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree (National Roads Authority, 2005-2011). In general, the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees). Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it. It will still be necessary to ensure that the area within the RPA is not used for vehicle parking or the storage of materials (including oils and chemicals). Soil will not be placed within the Root Protection Area of trees or within 5m of hedgerows; the woodland will not be lit during the construction or operational phases of the development; and the construction compound will be located a minimum of 50m from watercourses.

In order to minimise the potential for disturbance to the woodland habitat to the north of the Proposed Development site the landscape masterplan has been designed to include the provision of a new native woodland habitat to the south of the existing area of woodland. This woodland will be contiguous with the existing woodland to the north of the development. A 1.6m high temporary stock proof fence will be provided along the southern boundary of the new area woodland until it has developed. The 10m strip fringing this woodland will be treated as a dense woodland boundary with an abundance of Prunus spinosa and Crataegus mongyna. This will provide protection for the woodland and minimise the potential for disturbance.

7.1.5 Operation Phase Mitigation Measures

Standard measures have been incorporated into the design of the Proposed Development to ensure that surface water discharging from the Proposed Development site is clean and does not have the potential to result in pollution to the estuary at the surface water outfall location. These design measures include the provision of onsite attenuation so that all surface water draining from the Proposed Development site is restricted to green field runoff rates. This will be achieved by providing attenuation storage for the project, as described in Section 2 above.

- Hydrobrakes will be installed at each of the attenuation tanks provided for as part of the development.
- A full hydrocarbon and silt interceptor will be provided at the outlet of the attenuation pond so that all water being directed to the rising main first passes through the interceptor prior to its release from the site.
- A range of SuDS measures will be implemented that will further treat and manage surface water generated on site during the operation phase.

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

8 CONCLUSIONS

This NIS presents an analysis of the potential for the Proposed Development to result in adverse impacts to five European Sites identified during the screening for Appropriate Assessment as occurring within the zone of influence of the Proposed Development and requiring further examination as part of this NIS.

Impacts to several European sites were ruled out, namely River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Estuary SPA, and the North-West Irish Sea SPA, because targeted field surveys completed at the Proposed Development site confirmed that the Proposed Development site is not used as an *ex-situ* habitat by special conservation interest bird species and waterbirds of these SPAs.

Potential impacts to the features of interest of the four River Boyne and Estuaries European Sites were identified with regard to the potential for the Proposed Development to result in the emission of polluted waters, via hydrological pathways to the River Boyne. Other pathways that were identified during the screening as requiring examination as part of this NIS, such as air, noise and vibration and human disturbance pathways, were found not to have the potential to result in adverse effects to features of interest of the River Boyne and Estuaries European Sites.

An evaluation of the potential impact of discharges of waters via surface or groundwater pathways during the construction phase and/or operation phase has been completed. During the evaluation of potential impacts associated with the discharge of drainage waters it was found that, in the absence of mitigation measures, the potential will exist for contaminants to be released from the Proposed Development site to the River Boyne and for negative impacts to water quality to occur with associated adverse effects to the qualifying habitat and qualifying species of these European Sites.

A range of mitigation measures have been identified in this NIS that aim to avoid the discharge of contaminated surface drainage waters from the Proposed Development site during the operation phase. These standard mitigation measures, which are of common application, have been evaluated, and reference has been made to the best practice measures upon which they are based. It has been concluded that, provided all mitigation measures that aim to avoid the discharge of contaminated surface drainage waters are implemented, the potential for negative impacts to water quality and associated adverse effects to qualifying features of interest along the River Boyne and downstream at the Boyne Estuary will be eliminated. This in turn will eliminate the potential for adverse effects to the conservation objectives and integrity of the River Boyne and Estuaries European Sites.

In addition, best practice mitigation measures have been outlined in this NIS and will be implemented to avoid disturbance from other pathways such as air and human disturbance to non-qualifying woodland habitat occurring to the north of the Proposed Development site and located within the River Boyne and River Blackwater SAC.

On the basis of the content of this report, it is the considered view of the authors of this NIS that the competent authority is enabled to conduct an Appropriate Assessment and consider whether the proposed development, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites conservation objectives, will adversely affect the integrity of any European site.

It is the considered view of the authors of this NIS that it *can* be lawfully concluded by Meath County Council that the Proposed Development will not, either alone or in-combination with other plans or projects, result in adverse effects to the integrity and conservation status of European Sites in view of their Conservation Objectives and, on the basis of best scientific evidence, there is no reasonable scientific doubt as to that conclusion.

9 REFERENCES

- Cutts, N., Hemingway, K., Spencer J. (2013) Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects. Institute of Estuarine & Coastal Studies (IECS), University of Hull.
- Department of the Environment Heritage and Local Government (DEHLG) (2008) Circular letter SEA 1/08 & NPWS 1/08.
- Department of the Environment Heritage and Local Government (DEHLG) (2010). Appropriate Assessment of Plans and Projects. Guidance for Local Authorities.
- English Nature (1999). Habitats regulations guidance note no. 3 (HRGN No. 3). Determination of Likely Significant Effect under The Conservation (Natural Habitats &c) Regulations 1994.
- European Commission (2000). Managing European sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. Luxembourg.
- European Communities (2001). Assessment of plans and projects significantly affecting European sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Luxembourg.
- European Commission (1992). EU Habitats Directive.
- NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. Volume 3 - Species assessments. Department of Culture, Heritage and the Gaeltacht.
- NPWS (2015). Site Synopsis – Boyne Estuary SPA (004080). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
- NPWS (2013). Conservation Objectives – Boyne Estuary SPA 004080. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2016). Site Synopsis – Boyne Coast and Estuary SAC (001957). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
- NPWS (2012). Conservation Objectives – Boyne Coast and Estuary SAC 001957. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2013). Site Synopsis – Clogher Head SAC (001459). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
- NPWS (2017). Conservation Objectives – Clogher Head SAC 001459. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2023). Site Synopsis – North-West Irish Sea SPA (004236). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
- NPWS (2023). Conservation Objectives – North-West Irish Sea SPA 004236. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2014). Site Synopsis – River Boyne and River Blackwater SAC (002299). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

- NPWS (2021). Conservation Objectives – River Boyne and River Blackwater SAC 002299. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2010). Site Synopsis – River Boyne and River Blackwater SPA (004232). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
- NPWS (2024). Conservation Objectives – River Boyne and River Blackwater SPA 004232. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

APPENDIX A – CONSERVATION OBJECTIVES

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

Attribute No.	Attribute	Target	Consideration of likely significant effects
Boyne Estuary SPA			
Special conservation interest bird species			
1	Population trend	Long term population trend stable or increasing.	The discharge of inadequately treated surface water from the Proposed Development site to the River Boyne and downstream to the Boyne Estuary SPA will have the potential to combine with other sources of existing pressures to water quality within the estuaries transitional waters. Adverse effects to water quality downstream at the estuary, will in turn have the potential to undermine the habitats and the associated prey resource upon which the wetland bird species of the SPA rely. Such adverse effects could, over time, result in a decline in the long-term population trend supported by the sections of the SPA surrounding the Proposed Development site and discharge locations.
2	Distribution	No significant decrease in the range, timing and intensity of use of areas by the special conservation interest bird species of the SPA other than that occurring from natural patterns of variation.	For reasons outlined for Attribute No. 1 above the discharge of inadequately treated and contaminated surface water from the Proposed Development site will have the potential to undermine the targets for this attribute.
Boyne Coast and Estuaries SAC			
Tidal mudflats and sandflats			
3	Habitat area	The permanent habitat area is stable or increasing, subject to natural processes.	The discharge of inadequately treated and contaminated surface water to this habitat will not have the potential to undermine its extent within the SAC.

Attribute No.	Attribute	Target	Consideration of likely significant effects
4	Community distribution	Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with *Hediste diversicolor* and *Corophium volutator* community; and Fine sand dominated by bivalves community complex.	The discharge of inadequately treated and contaminated surface water to this habitat could contribute to water quality pressures within the estuary and result in changes to the community of infauna supported by this habitat.
Estuaries			
5	Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession.	The discharge of inadequately treated and contaminated surface water to this habitat could result in changes to the vegetation community of this habitat, resulting over time in a decrease in the extent of this habitat.
6	Community distribution	Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with *Hediste diversicolor* and *Corophium volutator* community; and Subtidal fine sand dominated by polychaetes community.	For reasons outlined for Attribute No. 5 above the discharge of inadequately treated and contaminated surface water to this habitat could result in a decrease in the distribution of this habitat.
Salicornia muds			
7	Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic flora species associated with this habitat and therefore impact habitat area and distribution.

Attribute No.	Attribute	Target	Consideration of likely significant effects
8	Habitat distribution	No decline, or change in habitat distribution, subject to natural processes.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic flora species associated with this habitat and therefore impact habitat area and distribution.
9	Physical structure: sediment supply	Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions.	Works are not taking place within or adjacent to this habitat therefore there will be no impact on natural processes.
10	Physical structure: creeks and pans	Maintain creek and pan structure, subject to natural processes, including erosion and succession.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic species associated with this habitat and therefore impact vegetation structure and composition.
11	Physical structure: flooding regime	Maintain natural tidal regime.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic species associated with this habitat and therefore impact vegetation structure and composition.
12	Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic species associated with this habitat and therefore impact vegetation structure and composition.
13	Vegetation structure: vegetation height	Maintain structural variation within sward.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic species associated with this habitat and therefore impact vegetation structure and composition.

Attribute No.	Attribute	Target	Consideration of likely significant effects
14	Vegetation structure: vegetation cover	Maintain more than 90% of area outside creeks vegetated.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic species associated with this habitat and therefore impact vegetation structure and composition.
15	Vegetation composition: typical species and sub-communities	Maintain the presence of species-poor communities listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009).	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the sensitive aquatic species associated with this habitat and therefore impact vegetation structure and composition.
16	Vegetation structure: negative indicator species - *Spartina anglica*	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1%.	The Proposed Development does not include any works within the European site, or any works which could contribute to the expansion of common cordgrass.
River Boyne and River Blackwater SAC			
River Lamprey			
17	Distribution (extent of anadromy for sea lamprey)	Access to all watercourses down to first order streams for brook and river lamprey. Greater than 75% of main stem length of rivers accessible from the estuary.	There will be no reduction in species distribution given that alterations to river morphology and structures which could limit habitat accessibility are not proposed.
18	Population structure of juveniles	At least three age/size groups present.	There will be potential for the Proposed Development to impact on the population structure of juveniles occurring along the River Boyne. The pathways that could affect population structure are the discharge of surface runoff from construction areas and

Attribute No.	Attribute	Target	Consideration of likely significant effects
			related activities during the construction phase and from impermeable surfaces during the operation phase. It is noted that during normal working conditions surface water generated at active construction footprints associated with the Proposed Development is predicted to drain to ground in surrounding permeable soils or hard-core areas. It is expected that there will be excess surface water from such construction footprints and hard-core areas only during times of excessive rainfall. The presence of the vegetated slopes to the north of the development footprint between the Proposed Development and the River Boyne will provide a buffer that will entrain runoff from these areas and assist in minimising the potential for the discharge of contaminated runoff from these areas to the river. However, surface water generated within the footprint of the Proposed Development site could drain to ground and negatively influence the water quality of groundwater base flows. Given the karstified nature of the bedrock geology occurring at the Proposed Development site there is potential for such base flows to be conveyed north via subsurface conduits to the River Boyne. An accidental pollution event during construction and/or operation, of a sufficient magnitude, could influence the quality, extent and availability of any juvenile habitat present downstream of the Proposed Development which in turn could affect the population structure and density of the juvenile lamprey population. Additionally, an accidental pollution event during construction and/or operation, of a sufficient magnitude, could impact lamprey spawning habitat downstream through silt

Attribute No.	Attribute	Target	Consideration of likely significant effects
			smothering sand/gravel beds. Such impacts could affect the extent and distribution of spawning grounds.
19	Juvenile density in fine sediment	Mean catchment juvenile density of at least 2/m2 for river and brook lamprey and 1/m2 for sea lamprey.	For the reasons outlined for Attribute No. 18 above the Proposed Development will have the potential to result in a decrease in the density of juveniles in fine sediments along the River Boyne.
20	Extent and distribution of spawning habitat	No decline in distribution and extent of spawning beds.	For the reasons outlined for Attribute No. 18 above the Proposed Development will have the potential to result in a decline in distribution and extent of spawning beds.
21	Availability of juvenile habitat	More than 50% of sample sites positive.	For the reasons outlined for Attribute No. 18 above the Proposed Development will have the potential to result in a change to the availability of juvenile habitat.
Atlantic Salmon			
22	Distribution (extent of anadromy	100% of river channels down to second order from the estuary.	There will be no reduction in species distribution given that alterations to river morphology and structures which could limit habitat accessibility are not proposed.
23	Adult spawning fish	Conservation Limit consistently exceeded.	An accidental pollution event during construction and/or operation of a sufficient magnitude could impact fish through silt smothering spawning grounds or affecting respiration, chemical contaminants physically damaging fish or causing mortality as a result of toxins. Such impacts could result in a reduction in fish numbers, at least temporarily, with an increased risk of a population level effect if a pollution event were to occur in conjunction with fish migrating upstream from the sea to spawning grounds. Impacts could also result in a reduction in salmon fry abundance downstream, at least temporarily. .

Attribute No.	Attribute	Target	Consideration of likely significant effects
24	Salmon fry abundance	Maintain or exceed 0+ fry mean catchment wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling.	An accidental pollution event during construction and/or operation of a sufficient magnitude could impact fish through silt smothering spawning grounds or affecting respiration, chemical contaminants physically damaging fish or causing mortality as a result of toxins. Such impacts could result in a reduction in fish numbers, at least temporarily, with an increased risk of a population level effect if a pollution event were to occur in conjunction with fish migrating upstream from the sea to spawning grounds. Impacts could also result in a reduction in salmon fry abundance downstream, at least temporarily.
25	Out-migrating smolt abundance	No significant decline.	An accidental pollution event during construction and/or operation of a sufficient magnitude could impact fish through silt smothering spawning grounds or affecting respiration, chemical contaminants physically damaging fish or causing mortality as a result of toxins. Such impacts could result in a reduction in fish numbers, at least temporarily, with an increased risk of a population level effect if a pollution event were to occur in conjunction with fish migrating upstream from the sea to spawning grounds. Impacts could also result in a reduction in salmon out-migrating smolt, at least temporarily.
26	Number and distribution of redds	No decline in numbers or distribution.	Increased silt loading could affect the distribution and abundance of redds downstream from the proposed development.
27	Water quality	At least Q4.	For the reasons outlined in Section 6.2 and 6.7 above, the Proposed Development in combination with other existing pressures and potentially with other projects will have the potential to result in a decline in water quality along the River Boyne that would depress the Q-value of this watercourse.

Attribute No.	Attribute	Target	Consideration of likely significant effects
Otters			
28	Distribution	No significant decline.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially adversely affect the water quality of otter habitat and result in declines of forage species for otter and therefore impact otter distribution within the SAC.
29	Extent of terrestrial habitat	No significant decline.	The extent of terrestrial habitat for otter within SACs is based upon a 10m buffer zone along riverbanks. The footprint of the Proposed Development is buffered from the River Boyne by approximately 135m, whilst the northern boundary of the Proposed Development site is set back from the River Boyne by approximately 20m.
30	Extent of marine habitat	No significant decline.	The Proposed Development will not have any potential to interfere with this attribute and target due to the remote location of marine otter habitat from the Proposed Development site.
31	Extent of freshwater habitat (river)	No significant decline.	For the reasons outlined for Attribute No. 8 above, the Proposed Development will have the potential to undermine this target.
32	Extent of freshwater habitat (lakes)	No significant decline	This attribute and target are not relevant to the Proposed Development as no lakes occur within the catchment area.
33	Couching sites and holts	No significant decline.	No couching sites or holts were identified as occurring along the section of the River Boyne to the north of the Proposed Development site during field surveys between 2021 and 2023. No holts or couching sites occur in the immediate vicinity of the project, and none will be disturbed by the project's activities.

Attribute No.	Attribute	Target	Consideration of likely significant effects
34	Fish biomass	No significant decline.	An accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the water quality within the SAC which in turn would impact fish biomass availability.
35	Barriers to connectivity	No significant increase.	For the reasons outlined for Attribute No. 1 above, the Proposed Development will not have the potential to undermine this target
Alluvial woodland			
36	Habitat area		As this habitat is periodically inundated by the annual rise of river levels (NPWS, 2013a), an accidental pollution event during construction and/or operation, of a sufficient magnitude, could potentially negatively affect the water quality of this habitat, impacting the vegetation within the habitat, and therefore impacting habitat area, habitat distribution, woodland size and woodland structure.
37	Habitat distribution	No decline, subject to natural processes.	
38	Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size.	
39	Woodland structure: cover and height	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%.	
40	Woodland structure: community diversity and extent	Maintain diversity and extent of community types.	
41	Woodland structure: natural regeneration	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other	

Attribute No.	Attribute	Target	Consideration of likely significant effects
		native tree species occur in adequate proportions to ensure survival of woodland canopy.	
42	Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation.	
43	Woodland structure: dead wood	At least 19 stems/ha of dead wood of at least 20cm diameter.	
44	Woodland structure: veteran trees	No decline.	
45	Woodland structure: indicators of local distinctiveness	No decline in distribution and, in the case of red listed and other rare or localised species, population size.	
46	Woodland structure: indicators of overgrazing	All five indicators of overgrazing absent. These indicators are topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, severe recent bark stripping, and trampling.	
47	Vegetation composition: native tree cover	No decline. Native trees cover at least 90% of canopy; target species cover at least 50% of canopy.	

Attribute No.	Attribute	Target	Consideration of likely significant effects
48	Vegetation composition: typical species	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present.	
49	Vegetation composition: negative indicator species	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent.	
50	Vegetation composition: problematic native species	Cover of common nettle (Urtica dioica) less than 75%.	
River Boyne and River Blackwater SPA			
Kingfisher			
51	Breeding population abundance: apparently occupied nests	No significant decline.	No nest sites or suitable nesting habitat for kingfisher occur at the Proposed Development site. There is no suitable nesting habitat for this species occurring along the section of the River Boyne to the north of the Proposed Development site. As such there will be no potential for the Proposed Development to result in a decline in the number of occupied nest sites supported by the SPA.
52	Productivity rate: fledged young per breeding pair	No significant decline.	For the reasons outlined for Attribute No. 51 and the examination of impacts considered in Section 6.1 to 6.7 above the Proposed Development will have the potential to undermine this target.

Attribute No.	Attribute	Target	Consideration of likely significant effects
53	Distribution: suitable nesting habitat	No significant decline.	For the reasons outlined for Attribute No. 51 and the examination of impacts considered in Section 6.1 to 6.7 above the Proposed Development will have the potential to undermine this target.
54	Prey biomass available	No significant decline.	For the reasons outlined for Attribute No. 51 and the examination of impacts considered in Section 6.1 to 6.7 above the Proposed Development will have the potential to undermine this target.
55	Barriers to connectivity	No significant increase.	For the reasons outlined for Attribute No. 51 and the examination of impacts considered in Section 6.1 to 6.7 above the Proposed Development will have the potential to undermine this target.
56	Disturbance at breeding sites	Human activities should occur at levels that do not adversely affect the breeding population.	For the reasons outlined for Attribute No. 51 and the examination of impacts considered in Section 6.1 to 6.7 above the Proposed Development will have the potential to undermine this target.