6. BIODIVERSITY

6.1 Introduction

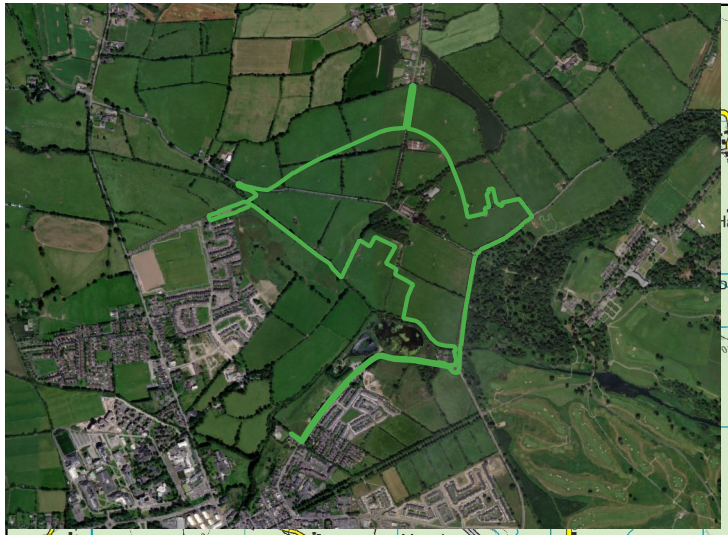
This chapter assesses the likely significant effects (both alone and cumulatively with other plans and projects) that the proposed development may have on Biodiversity, Flora and Fauna and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified. The residual impacts on biodiversity are then assessed. Particular attention has been paid to species and habitats of ecological importance. These include species and habitats with national and international protection under the Wildlife Acts 1976-2012 as amended, EU Habitats Directive 92/43/EEC. The full description of the Proposed Development is provided in Chapter 4 of this EIAR.

The chapter is structured as follows

The Introduction provides a description of the legislation, guidance and policy context applicable to Biodiversity, Flora and Fauna.
This is followed by a comprehensive description of the ecological survey and impact assessment methodologies that were followed to inform the robust assessment of likely significant effects on ecological receptors.
A description of the Baseline Ecological Conditions and Receptor Evaluation is then provided.
This is followed by an Assessment of Effects which are described with regard to each phase of the development: construction phase, operational phase and decommissioning phase. Potential Cumulative effects in combination with other plans and projects are fully assessed.
Proposed mitigation and best practice measures to avoid, reduce or offset the identified effects are described and discussed. This is followed by an assessment of residual effects taking into consideration the effect of the proposed mitigation and best practice measures.
The conclusion provides a summary statement on the overall significance of predicted effects on Biodiversity, Flora and Fauna.

The following defined terms are utilised in this chapter:

For the purposes of this EIAR, the entire project is referred to as the 'Proposed Development'.
For the purpose of this EIAR chapter, the term 'EIAR Site Boundary'/ 'Site Boundary' refers to the site red line boundary as shown in Figure 6-1. Figure 6.2 shows the site boundaries for the 6 separate application sites.
The term 'development footprint' is used to describe the lands that will be subject to the proposed infrastructure and associated construction works.
"Key Ecological Receptor" (KER) is defined as a species or habitat occurring within the zone of influence of the development upon which likely significant effects are anticipated.
"Zones of Influence" (ZOI) for individual ecological receptors refers to the zone within which potential effects are anticipated. ZOIs differ depending on the sensitivities of particular habitats and species and were assigned in accordance with best available guidance and through adoption of a precautionary approach.



Map Legend

EIAR Site Boundary

Drawing Title

EIAR Site Boundary

Project Title

Sky Castle Ltd – Moygaddy Mixed Use Scheme, Co. Meath & Co. Kildare

Drawn By	Checked By
CM	CM
Project No.	**Drawing No.**
210414	Figure 6-1
Scale	**Date**
1:49,500	2022-08-30

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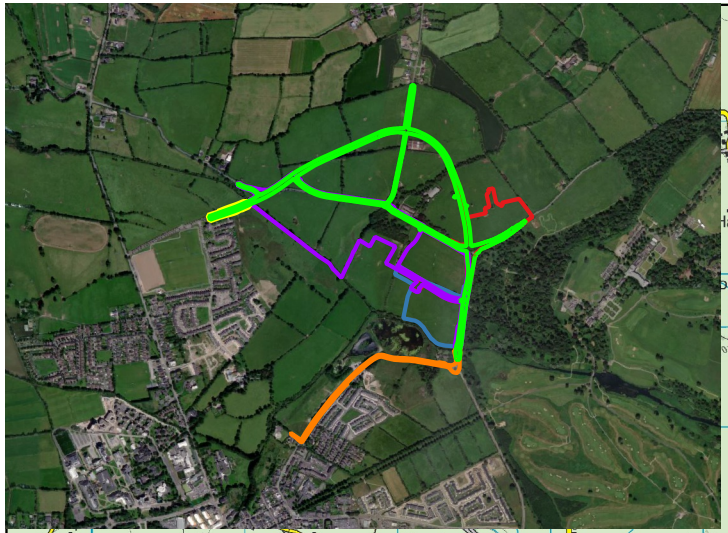

Map Legend

- Site A - Strategic Employment Zone
- Site B - Healthcare Facilities
- Site C - Strategic Housing Development
- MOOR- Maynooth Outer Orbital Road
- Kildare Bridge
- Moyglare Bridge

Drawing Title
Six Planning Applications Site Boundaries

Project Title
Sky Castle Ltd – Moygaddy Mixed Use Scheme, Co. Meath & Co. Kildare

Drawn By	Checked By
CM	CM
Project No.	Drawing No.
210414	Figure 6-2
Scale	Date
1:49,500	2022-08-30

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6.2 Requirements for Ecological Impact Assessment

National Legislation

The Wildlife Act, 1976–2012 as amended, is the principal piece of legislation governing protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act conserves wildlife (including game) and protects certain wild creatures and flora. These species are therefore considered in this report as ecological receptors.

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the AA process, or screening for same, does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated[1] However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2020).

The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) lists the species, hybrids and/or subspecies of flora protected under Section 21 of the Wildlife Acts. It provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. It illegal to cut, pick, collect, uproot or damage, injure or destroy species listed or their flowers, fruits, seeds or spores or wilfully damage, alter, destroy or interfere with their habitat (unless under licence).

National Policy

The National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017) (the "**Plan**") demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect Ireland's biodiversity for the benefit of future generations through a series of targeted strategies and actions. The main objective of the Plan is to bring biodiversity into the mainstream of policy and decision-making. Objective 1 (*Mainstream biodiversity into decision-making across all sectors*) of the Plan identifies the following relevant measures in relation to future developments:

> "Incorporate into legislation the requirement for consideration of impacts on biodiversity to ensure that conservation and sustainable use of biodiversity are taken into account in all relevant plans and programmes and relevant new legislation;
> Public and Private Sector relevant policies will use best practice in SEA, AA and other assessment tools to ensure proper consideration of biodiversity in policies and plans;
> All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure;
> Strengthen ecological expertise in local authorities and relevant Government Departments and agencies;
> Local Authorities will review and update their Biodiversity and Heritage Action Plans;
> Local Authorities will review and update their Development Plans and policies to include policies and objectives for the protection and restoration of biodiversity;
> Develop Green Infrastructure at local, regional and national levels and promote the use of nature based solutions for the delivery of a coherent and integrated network;

[1] https://www.npws.ie/protected-sites/nha (accessed May 2021).

Continue to produce guidance on the protection of biodiversity in designated areas, marine and the wider countryside for Local Authorities and relevant sectors;
Integrate Natura 2000 and Biodiversity financial expenditure tracking into Government Programmes internal paying agency management procedures including linkage to the Prioritised Action Framework and this NBAP;
Develop a Natural Capital Asset Register and national natural capital accounts by 2020, and integrate these accounts into economic policy and decision-making;
Initiate natural capital accounting through sectoral and small scale pilot studies, including the integration of environmental and economic statistics using the framework of the UN System of Experimental-Ecosystem Accounting (SEEA);
Establish a national Business and Biodiversity Platform under the CBD's Global Business Partnership;
Ensure Origin Green produces tangible benefits for biodiversity with increased emphasis on conservation and restoration of biodiversity;
Implement actions from Ireland's Biodiversity Climate Change Sectoral Adaptation Plan;
Identify and take measures to minimise the impact of incentives and subsidies on biodiversity loss, and develop positive incentive measures, where necessary, to assist the conservation of biodiversity;
Establish and implement mechanisms for the payments of ecosystem services including carbon stocks, to generate increased revenue for biodiversity conservation and restoration;
Develop and implement a National Biodiversity Finance Plan to set out in detail how the actions and targets of this NBAP will be delivered from 2017 and beyond; and
Monitor the implementation of the Plan"

Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

European Legislation

The EU Habitats Directive (92/43/EEC) (together with the Birds Directive (79/409/EEC), as subsequently codified by Council Directive 2009/147/EC on the conservation of wild birds) forms the cornerstone of Europe's nature conservation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. The Habitats Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance. The Habitats Directive and Birds Directive, which were transposed into Irish law through Part XAB of the Planning and Development Acts 2000-2019 (from a land use planning perspective) recognise the significance of protecting rare and endangered species of flora and fauna, and more importantly, their habitats.

Annex I of the Habitats Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as lesser horseshoe bat and otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed on both Annex II and Annex IV.

The disturbance of species under Article 12 of the Habitats Directive (and in particular avoidance of deliberate disturbance of Annex IV species, particularly during the period of breeding, rearing, hibernation and migration and avoidance of deterioration or destruction of breeding sites or resting places) has been specifically assessed in this EIAR.

Council Directive 2009/147/EC on the conservation of wild birds (the "**Birds Directive**") instructs Member States to take measures to maintain populations of all bird species naturally occurring in the

wild state in the EU (Article 2). According to Recital 1 of the Birds Directive, Council Directive 79/409/EEC on the conservation of wild birds was substantially amended several times and in the interests of clarity and rationality, the Birds Directive codifies Council Directive 79/409/EEC. Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

In summary, the species and habitats provided National and International protection under these legislative and policy documents have been considered in this Ecological Impact Assessment. A detailed assessment of the likelihood of the proposed development having either a significant effect or an adverse impact on any relevant European Sites (i.e. SACs, cSACs, SPAs or cSPAs) has been carried out in the Appropriate Assessment Screening Report and Natura Impact Statement. A separate assessment has not been carried out in this chapter, to avoid duplication of assessments. However, the relevant conclusions have been cross-referenced and incorporated.

6.3 Relevant Guidance

The assessment methodology is based primarily upon the National Road Authority (NRA)'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). Although these survey methodologies relate to road schemes, these standard guidelines are recognised survey methodologies that ensure good practice regardless of the development type.

In addition, the following guidelines were consulted in the preparation of this document to provide the scope, structure and content of the assessment:

Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater and Coastal (CIEEM, 2018).
Bats and onshore wind turbines: survey, Assessment and mitigation (SNH, 2019)
Draft Revised guidelines on the information to be contained in Environmental Impact Statements (Environmental Protection Agency (EPA), 2017).
Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment. (Department of the Environment, Community and Local Government (DoEHLG), 2013).
Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2009).
Environmental Assessment and Construction Guidelines (NRA, 2006).
Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA, 2003).
Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002).
Guidance on the preparation of the Environmental Impact Assessment Report (European Commission (EC), 2017)

This assessment has been carried out in accordance with the Environmental Impact Assessment guidance as outlined in Chapter 1 of the EIAR.

In addition to the above, the following legislation applies with respect to habitats, fauna and water quality in Ireland and has been considered in the preparation of this report:

The International Convention on Wetlands of International Importance especially Waterfowl Habitat (Concluded at Ramsar, Iran on 2 February 1971)
S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009 and S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003 which give further effect to EU Water Framework Directive (2000/60/EC).

The following legislation applies with respect to non-native species:

Regulation 49 and 50 of European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011).

This assessment has been prepared with respect to the various planning policies and strategy guidance documents listed below:

Meath County Development Plan 2021 – 2027.
Draft Natura Impact Report on the Meath County Development Plan, Meath County Council, (2021).
National Biodiversity Action Plan 2017-2021
The Regional Planning Guidelines for the Greater Dublin Area 2010-2022

6.3.1 Statement of Authority

A field assessment surveys were undertaken by Julie O'Sullivan (B.Sc., M.Sc.) and Colin Murphy (B.Sc., M.Sc.) across multiple dates in July 2021. Additional follow up surveys were carried out in July 2022. Bat surveys were carried out across various dates in July and August 2021. This report has been prepared by Colin Murphy (B.Sc., M.Sc.). Colin is an experienced ecologist with over two years professional experience in ecological consultancy. This report has been reviewed by Pat Roberts (B.Sc. (Env.)) who has over 16 years' experience in ecological consultancy.

6.4 Methodology

Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological baseline conditions are those existing in the absence of proposed activities (CIEEM, 2018).

The following sections outline the methodologies utilised to establish the baseline ecological condition of the proposed development site.

6.4.1 Desk Study

The desk study undertaken for this assessment included a thorough review of available ecological data including the following:

Review of online web-mappers: National Parks and Wildlife Service (NPWS), EPA (Envision), Water Framework Directive (WFD), Geological Survey of Ireland (GSI) & Inland Fisheries Ireland (IFI).
Review of the publicly available National Biodiversity Data Centre (NBDC) web-mapper.

Data on potential occurrence of protected bryophytes – as per NPWS online map viewer; Flora Protection Order Map Viewer – Bryophytes[2].
IFI Reports.
Review of specially requested records from the NPWS Rare and Protected Species Database for the hectad N93 in which the Proposed Development is located.
Review of NPWS Article 17 Metadata and GIS Database Files

6.4.2 Scoping and Consultation

MKO undertook a scoping exercise during preparation of this EIAR, as described in Chapter 2, Section 2.6 of this EIAR.

Copies of all scoping responses are included in Appendix 2-1 of this EIAR. The recommendations of the consultees have informed the EIAR preparation process and the contents of this chapter. Issues and concerns highlighted with respect to biodiversity are highlighted in Table 6.1 below.

Table 6-1 Organisations consulted with regard to biodiversity

Consultee	Response
Inland Fisheries Ireland -	The Liffey Catchment is regarded as a very important fishery and so requests due consideration to the catchment area. A buffer zone of 10 meters (minimum) is requested between the River Rye and the Proposed Development. The Blackhall Little Stream which runs through the middle of the site should not be altered or disturbed, and again a buffer zone is requested. Riparian vegetation should be left undisturbed as much as possible. Best practice is recommended at all times in relation to activities that may impact surface waters. Gathering of baseline data (biotic and abiotic) pre-construction to allows for comparison between the current situation and that which may develop over time if the project proceeds Comprehensive surface water management measures must be implemented.

A scoping exercise was undertaken as part of the proposed development. A Scoping Document, providing details of the application site and the proposed development, was prepared by MKO and circulated to the Development Applications Unit in August 2021. As of 23rd August 2022, no response has yet been received.

6.4.3 Field Surveys

A comprehensive survey of the biodiversity of the entire site was undertaken on various dates in 2021. Additional surveys of the study area was undertaken in July 2022. The following sections fully describe the ecological surveys that have been undertaken and provide details of the methodologies, dates of survey and guidance followed.

6.4.3.1 Multi-disciplinary Walkover Surveys (as per NRA Guidelines, 2009)

A Multi-disciplinary ecological walkover surveys was undertaken on the 6th of July 2021 and 21st of July 2022 in accordance with NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). This survey provided baseline data on the ecology of

[2] *NPWS, 2020, Online map viewer; Flora Protection Order Map Viewer – Bryophytes. Online, Available at: http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e, Accessed: December 2021.*

the study area and assessed whether further, more detailed habitat or species-specific ecological surveys were required. The multi-disciplinary ecological walkover survey comprehensively covered the entire study area. The site was revisited by MKO Ecologist on multiple occasions throughout July and August 2022.

Habitats were classified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011).

Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

The walkover surveys were designed to detect the presence, or likely presence, of a range of protected habitats and species that may occur in the vicinity of the proposed development. Incidental sightings/observations of birds and additional fauna were noted during the site visits. Surveys were undertaken in accordance best practice guidance (TII, 2008: Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes).

During the multi-disciplinary ecological walkover surveys, a thorough search of the site for mammals was undertaken and the potential for the study area to support protected mammals listed in the Wildlife Acts, 1976–2019, such as badger, pine marten, red squirrel, Irish hare, pygmy shrew, Irish stoat etc. was also assessed.

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS), with a focus on those listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011), was also conducted.

The walkover survey was undertaken on the 6th of July 2021 by Julie O'Sullivan and Colin Murphy. An additional walkover survey was undertaken by Colin Murphy on the 21st of July 2022. The survey timing falls within the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith et al., 2011).

6.4.3.2 Bat Surveys

Bat walkover surveys of the study area were carried out during daylight hours on the 8th July, 22nd July and 9th August 2021. The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) (Collins, 2016). Table 4.1 of the 2016 BCT Guidelines identifies a grading protocol for assessing structures, trees and commuting/foraging habitat for bats. The protocol is divided into four Suitability Categories: *High, Moderate, Low* and *Negligible.*

Full details of the bat survey effort and results can be found in the bat report located in Appendix 6.1

Roost Surveys

During the bat walkover surveys, a search for roosts was undertaken within the boundary of the proposed development. The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. During the walkover, mature trees were assessed for their suitability to support bats.

Trees within the site were also assessed from ground level, with the aid of binoculars. Any potential tree roosts were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (i.e. PRFs) identified by Andrews (2018).

Dusk and Dawn Surveys

Dusk and dawn activity surveys were carried out on 8th July, 22nd July and 9th August 2021. Two surveyors were equipped with active full spectrum bat detectors, a Batlogger M (Elekon, Lucerne, Switzerland) and walked a transect route within the site, focusing on potentially suitable habitat features for bats. Where possible, species identification was made in the field and any other relevant information was also noted, e.g. numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications.

The dusk survey on 8th July 2021 commenced 30 minutes before sunset and was completed within 3 hours after sunset. Conditions were suitable for bat survey as per Collins (2016); dry, mild (18˚C at sunset) with only light air (Beaufort Scale Force 1). The moon was not visible, and cloud cover was approximately 100% during the dusk survey.

The dawn survey on 22nd July 2021 commenced 2 hours before sunrise and was completed at sunrise. Conditions were suitable for bat survey as per Collins (2016); dry, mild (15˚C at sunrise) with only light air (Beaufort Scale Force 1). Cloud cover was approximately 10% throughout the dawn survey.

The dusk survey on 9th August 2021 commenced 30 minutes before sunset and was completed within 3 hours after sunset. Conditions were suitable for bat survey as per Collins (2016); dry, mild (17˚C at sunset), with only light air to light breeze (Beaufort Scale Force 1). Cloud cover was approximately 25% throughout the dusk survey.

July and August are within the optimum survey period for bat activity surveys, provided weather conditions are favourable (Collins, 2016). No limitations associated with seasonality, timing or weather conditions were identified.

Table 6-2 Bat survey effort

Date	Surveyor	Type	Sunrise/Sunset	Weather
8th July 2021	Tim Murphy and Neil Campbell	Dusk	21:52	18˚C; Dry, Light air
22nd July 2021	Tim Murphy and Neil Campbell	Dawn	05:27	15˚C; Dry, Light air
9th August 2021	Tim Murphy and Neil Campbell	Dusk	21:05	17˚C; Dry, Light air

Static Detector Surveys

Full spectrum bat detectors, Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA), were deployed during static surveys to record bat activity at six fixed locations over 2-week periods in 2021. The six locations of static detectors were selected to represent the range of habitats present within the site, including favourable bat habitats as well as open spaces within the site. Settings used were those recommended by the manufacturer for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates.

The survey was designed to utilise three static detectors to monitor bat activity. Two Song Meter SM4BAT detectors were deployed on site on 8th July 2021. The Song Meter SM4, dual-channel acoustic recorder is capable of the long-term acoustic monitoring of bats. After approximately two weeks, the static detectors were relocated to three separate new locations within the site. Static detector locations can be found in Figure 3-1 in the bat report. The static detectors were collected on the 9th August 2021.

Details of the surveys carried out including date, time, duration, location and weather conditions are provided in the Bat report in Appendix 4 of this document.

Badger Survey

Dedicated badger surveys were conducted on the 6th of July 2021. In addition, records of any badger activity within the study area were also recorded during other faunal and habitat surveys of the site. The badger surveys covered the entire development footprint. The site was systematically searched for signs of badger, incidental setts, prints, latrines, foraging signs or sightings. If encountered, setts were classified as per the convention set out in NRA (2009) (i.e. main, annexe, subsidiary, outlier) and camera traps were installed at the entrances and left *in situ* for 3 weeks. The badger survey was not constrained by vegetation given the nature of the habitats within the site and the timing of the surveys (NRA 2006a).

The badger survey was conducted adhering to best practice guidance (NRA, 2009) and followed the 'Guidelines for the Treatment of Badger Prior to the Construction of National Roads Schemes' (NRA, 2006a) and following CIEEM best practice competencies for species surveys (CIEEM, 2013[3]).

Otter Survey

Following a review of the initial site walkover ecological surveys for constraints identification and the results of the multi-disciplinary walkover survey; areas identified as providing potential habitat for otter were subject to specialist targeted survey. The otter survey of the Rye Water River located along the southern end of the site was conducted on the 6th of July 2021.

The otter surveys were conducted as per NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). This involved a search for all otter signs e.g. spraints, scat, prints, slides, trails, couches and holts. In addition to the width of the rivers/watercourses, a 10m riparian buffer (both banks) was considered to comprise part of the otter habitat (NPWS 2009). The dedicated otter surveys also followed the guidance as set out in NRA (2008) 'Guidelines for the Treatment of Otters Prior to the Construction of National Roads Schemes' and following CIEEM best practice competencies for species surveys (CIEEM, 2013).

Barn owl survey

A dedicated barn owl survey was undertaken at the site on the evening of the 21th of July 2021, by Colin Murphy. The survey followed the methodologies outlined in the TII guidelines, '*Barn Owl Surveying Standards for National Road Projects'* (December, 2017).

The buildings within the site were assessed during the initial walkover survey on the 6th of July in order to determine suitability for breeding Barn Owls. Moygaddy Castle ruin within the northern section of the site was assessed as being potentially suitable as the interior offered potential nesting space.

A nocturnal survey was carried out on the 21th of July and focused on Moygaddy Castle. The building was observed from a discrete vantage point, set back 20m from the building. The dusk survey was carried out during calm and dry conditions for two hours and commenced 30 minutes prior to sunset.

Invasive species survey

During the multi-disciplinary walkover surveys, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

[3] *CIEEM, 2013, Technical Guidance Series – Competencies for Species Survey, Online, Available at: https://cieem.net/resource/competencies-for-species-survey-css/ Accessed: May 2021*

Rye Water Valley/Carton SAC Survey

A survey of the area to the east of Kildare bridge designated as part of Rye Water Valley/Carton House SAC was undertaken on the 21st of July 2022. The purpose of the survey was to identify any Petrifying springs with tufa formation (Cratoneurion) [7220], listed as a QI habitat for Rye Water Valley/Carton House SAC, that may be present in the lands adjacent to the proposed development boundary. The survey was carried out in line with the guidelines set out in Lyons & Kelly (2016).

6.4.4 Methodology for Assessment of Impacts and Effects

6.4.4.1 Identification of Target Receptors and Key Ecological Receptors

The methodology for assessment followed a precautionary screening approach with regard to the identification of Key Ecological Receptors (KERs). Following a comprehensive desk study, site visits were undertaken on the dates listed in Section 6.4.3.1 (not including bat surveys and stakeholder consultation), "Target receptors" likely to occur in the zone of influence of the development were identified. The target receptors included habitats and species that were protected under the following legislation:

Annexes of the EU Habitats Directive
Qualifying Interests (QI) of Special Areas of Conservation (SAC) within the likely zone of impact.
Species protected under the Wildlife Acts 1976-2019
Species protected under the Flora Protection Order 2015

6.4.4.2 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

International
National
County
Local Importance (Higher Value)
Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of National or International, County or Local importance (Higher Value) following the criteria set out in NRA (2009) are considered to be Key

Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

6.4.4.3 Characterisation of Impacts and Effects

The proposed development will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). These guidelines are the industry standard for the completion of Ecological Impact Assessment in the UK and Ireland. This chapter has also been prepared in accordance with the corresponding EPA guidance (EPA 2017). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

Positive or Negative. Assessment of whether the proposed development results in a positive or negative effect on the ecological receptor.
Extent. Description of the spatial area over which the effect has the potential to occur.
Magnitude Refers to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
Duration is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
Frequency and Timing. This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
Reversibility. This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

6.4.4.4 Determining the Significance of Effects

The ecological significance of the effects of the proposed development are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2018).

For the purpose of Ecological Impact Assessment (EcIA), 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2018).

When determining significance, consideration is given to whether:

Any processes or key characteristics of key ecological receptors will be removed or changed
There will be an effect on the nature, extent, structure and function of important ecological features
There is an effect on the average population size and viability of ecologically important species.
There is an effect on the conservation status of important ecological habitats and species.

The EPA draft Guidelines on information to be included in Environmental Impact Assessment Reports (EPA, 2017) and the *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines.

The terminology used in the determination of significance follows the suggested language set out in the Draft EPA Guidelines (2017) as shown in Table 6.3.

Table 6-3 Criteria for determining significance of effect, based on (EPA, 2017) guidelines

Effect Magnitude	Definition
No change	No discernible change in the ecology of the affected feature.
Imperceptible effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound effect	An effect which obliterates sensitive characteristics.

As per TII (NRA, 2009) and CIEEM (2018) best practice guidelines, the following key elements should also be examined when determining the significance of effects:

The likely effects on 'integrity' should be used as a measure to determine whether an impact on a site is likely to be significant (NRA, 2009).
A 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives (CIEEM, 2018).

Integrity

In the context of EcIA, 'integrity' refers to the coherence of the ecological structure and function, across the entirety of a site, that enables it to sustain all of the ecological resources for which it has been valued (NRA, 2009). Impacts resulting in adverse changes to the nature, extent, structure and function of component habitats and effects on the average population size and viability of component species, would affect the integrity of a site, if it changes the condition of the ecosystem to unfavourable.

Conservation status

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status. According to CIEEM (2018) guidelines the definition for conservation status in relation to habitats and species are as follows:

Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area
Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

As defined in the EU Habitats Directive 92/43/EEC, the conservation of a habitat is favourable when:

Its natural range, and areas it covers within that range, are stable or increasing
The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future

The conservation status of its typical species is favourable.

The conservation of a species is favourable when:

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

According to the NRA/CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological feature will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international).

6.4.4.5 Incorporation of Mitigation

Section 6.7 of this EIAR assesses the potential effects of the proposed development to ensure that all effects on Key Ecological Receptors (KERs) are adequately addressed. Where significant effects on Key Ecological Receptors are predicted, mitigation is incorporated into the project design or layout to address such impacts. The implemented mitigation measures avoid or reduce or offset potential significant residual effects, post mitigation.

6.4.4.6 Limitations

The information provided in this assessment accurately and comprehensively describes the baseline ecological environment following surveys on numerous dates during all seasons and over 3 years; provides an accurate prediction of the likely ecological effects of the proposed development; prescribes best practice and mitigation as necessary; and, describes the residual ecological impacts.

The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

The habitats and species on the site were readily identifiable and comprehensive assessments were made during the field visit. No significant limitations in the scope, scale or context of the assessment have been identified.

6.5 Establishing the Ecological Baseline

6.5.1 Desk Study

The following sections describe the results of a survey of published material that was consulted as part of the desk study for the purposes of the ecological assessment. It provides a baseline for the ecology of the existing environment. Material reviewed includes the Site Synopses for Designated Sites for their conservation importance compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht, bird and plant distribution atlases and other research publications.

6.5.1.1 Designated Sites

Identification of the Designated Sites within the Likely Zone of Influence of the Proposed Development

The potential for the proposed development to impact on sites that are designated for nature conservation was considered in this Ecological Impact Assessment.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under the EU Habitats Directive and EU Birds Directive, respectively and are collectively known as 'European Sites'. The potential for significant effects and/or adverse impacts on the integrity of European Sites is fully assessed in the AA Screening Report and Natura Impact Statement that accompanies this application. As per EPA draft Guidance 2017, *"a biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement"* but should *"incorporate their key findings as available and appropriate"*. Section 6.7.2 of this EIAR provides a summary of the key assessment findings with regard to European Designated Sites.

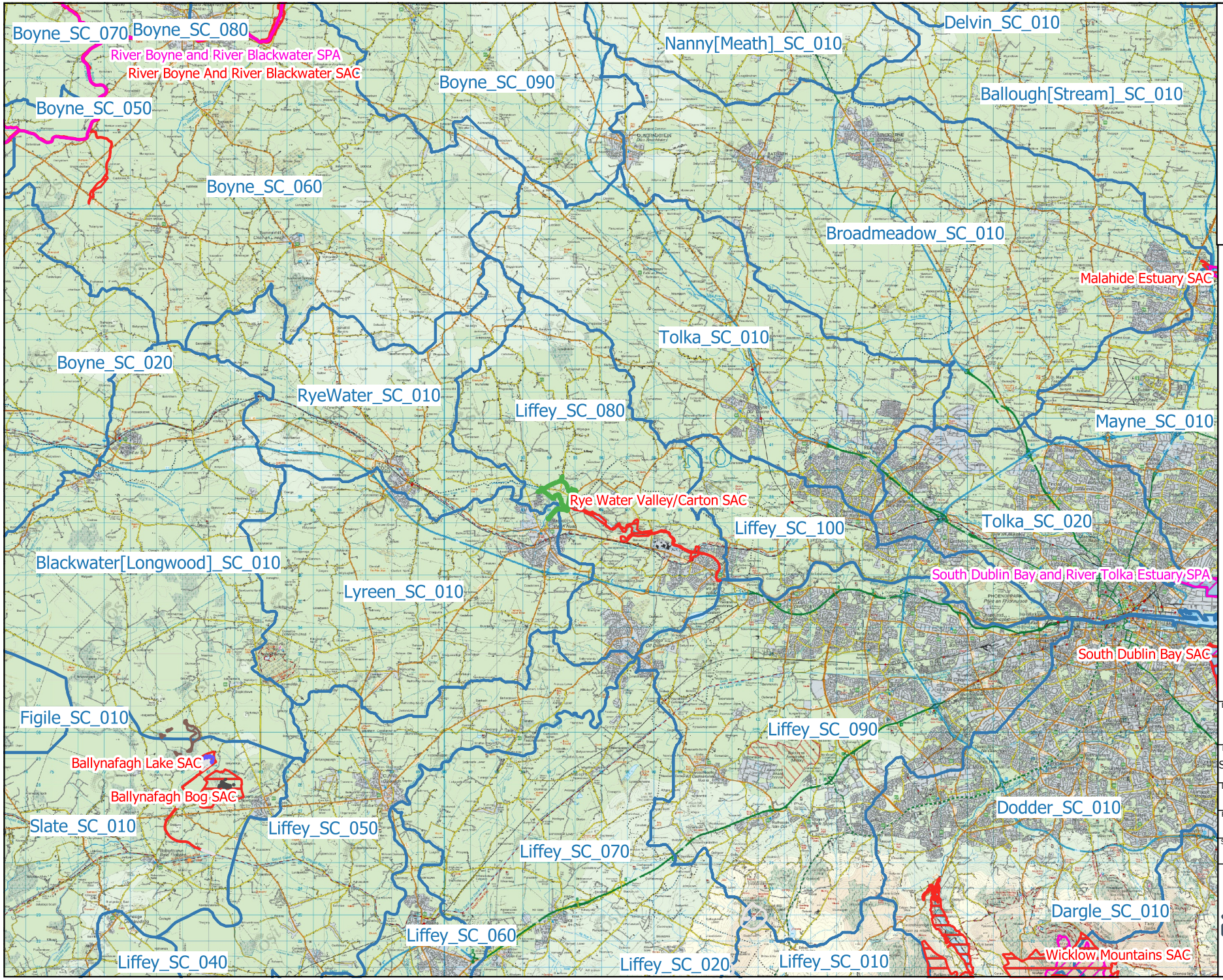
Natural Heritage Areas (NHAs) are designated under Section 18 the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this EcIA.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this EcIA.

The following methodology was used to establish which sites that are designated for nature conservation have the potential to be impacted by the proposed development:

> Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 13/01/2022. The datasets were utilised to identify Designated Sites which could feasibly be affected by the proposed development.
> All designated sites within a distance of 15km surrounding the development site were identified. In addition, the potential for connectivity with European or Nationally designated sites at distances of greater than 15km from the proposed development was also considered in this initial assessment. In this case, no potential for impact on sites located at a distance of over 15km from the proposed development was identified due to the absence of direct hydrological connections (e.g. without the Atlantic Ocean as a buffer).
> A map of all the European Sites within 15km is provided in Figure 6-3. All Nationally designated sites shown in Figure 6-4.
> Table 6.4 provides details of all relevant Nationally designated sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. All relevant European Designated Sites are fully described and assessed in the Screening for Appropriate Assessment and Natura Impact Statement reports submitted as part of this planning application.
> The designation features of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 13/01/2022.

Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.



Map Legend

- EIAR Site Boundary
- EPA Hydrological Sub Catchments
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Drawing Title
European Sites within Zone of Impact

Project Title
Sky Castle Ltd – Moygaddy Mixed Use Scheme, Co. Meath & Co. Kildare

Drawn By	Checked By
CM	CM
Project No.	Drawing No.
210414	Figure 6-3
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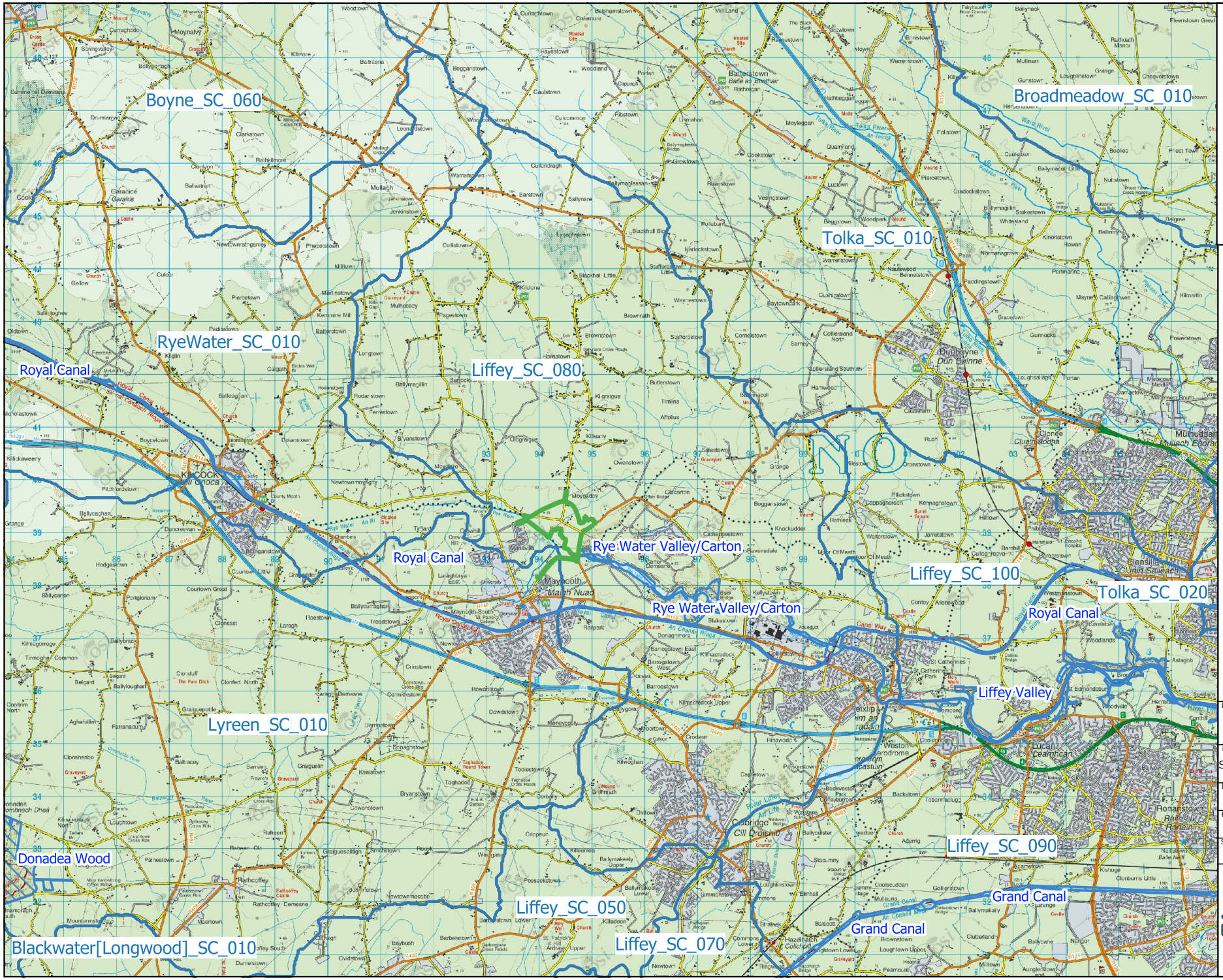

Map Legend

- EIAR Site Boundary
- EPA Hydrological Sub Catchments
- National Heritage Areas (NHA)
- Proposed Natioanl Heritage Areas (NHAs)

N

Drawing Title
Nationally Designated Sites within Zone of Impact

Project Title
Sky Castle Ltd – Moygaddy Mixed Use Scheme, Co. Meath & Co. Kildare

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Table 6-4 Designated sites in the Zone of Influence

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)		
Rye Water Valley/Carton SAC [001398]	**Distance:** 0m (directly adjacent to southern section of development boundary)	This European site is directly adjacent to southern section of development boundary, however it does not overlap. Considering the Proposed Development does not overlap with this European site, there is no potential for direct effects. No potential pathway for effect on any of the following terrestrial Qualifying Interests (QIs) for which the SAC is designated was identified. The River Rye Water flows along southern boundary of the development site. A potential pathway for indirect effects on water dependent Qualifying Interests (QIs) was identified in the form of deterioration of water quality resulting from pollution, associated with the construction and operational phases of the development. The River Rye water flows into this SAC, Pollution of surface water and groundwater may result in adverse impacts on the following downstream aquatic or groundwater influenced QI habitats within the SAC in the absence of mitigation: [7220] Petrifying springs with tufa formation (*Cratoneurion*)* [1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*) [1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*) **The SAC is in the Likely Zone of Impact and further assessment is required.**
South Dublin Bay SAC [000210]	**Distance:** 25km 31km (Surface water distance)	There will be no direct effects as the project footprint is located entirely outside the designated site. Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Qualifying Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SAC is located approx. 31km downstream of the Proposed Development site. On an extremely precautionary basis effects on the following aquatic receptors are considered. **The SAC is considered to be within the Likely Zone of Impact and further assessment is required.**

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
North Dublin Bay SAC [000206]	**Distance**: 25km 31km (Surface water distance)	This European Site is located 25km west of the Proposed Development site. Given the distance between the site of Proposed Development and this SAC, direct effects upon the SAC can be excluded. No potential pathway for effect on any of the terrestrial habitats for which the SAC is designated was identified, Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Qualifying Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SAC is located approx. 31km downstream of the Proposed Development site. On an extremely precautionary basis effects on the following aquatic receptors are considered: Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi)* [1410] This SAC is therefore **within the likely zone of impact**, due to the potential for pollutants to be transmitted to it indirectly via surface water.
Special Protection Area (SPA)		
North Bull Island SPA [004006].	**Distance**: 23km 31km (Surface water distance)	This site is 23km west of the Proposed Development site, therefore direct impacts upon this SPA can be excluded. Disturbance to SCI species can be ruled out due to the distance of 23km between the Proposed Development and this SPA. Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Special Conservation Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SPA is located approx. 31km downstream of the proposed development site. Potential effects on all SCI species are considered under Wetland and waterbirds [A999].

Designated Site	Distance from Proposed Development (km)	Likely Zone of Impact Determination
		This SPA is **within the likely zone of impact**, due to the potential for pollutants to be transmitted to it indirectly via surface water.
proposed Natural Heritage Areas (pNHA)		
Rye Water Valley/Carton pNHA [001398]	0km from site boundary	Rye Water Valley/Carton pNHA located downstream of the proposed development with hydrological connectivity via the Rye River. **Taking a precautionary approach, this site falls within the likely impact zone of the Proposed Development.**
Royal Canal pNHA [002103]	**Distance:** 0.96km	Royal Canal pNHA located downstream of the proposed development with hydrological connectivity via the Rye River. **Taking a precautionary approach, this site falls within the likely impact zone of the Proposed Development.**
Liffey Valley pNHA [000128]	**Distance:** 6.7km	Impacts on these pNHAs can be ruled out due to the distance and lack of connectivity between the proposed development site and these pNHAs. There is no complete source-pathway-receptor chain for impact. **These sites are not in the zone of likely impact, no further assessment is required.**
Grand Canal pNHA [002104]	**Distance:** 8.6km	
Donadea Wood pNHA [001391]	**Distance:** 10.9km	

Potential for effects on European sites is summarised in this report and is fully addressed in the Natura Impact Statement submitted as part of the application.

Where a nationally designated site (NHA), overlaps with the boundary of a European designated site, i.e. (SAC/SPA), the potential for impacts has been considered under the European designation.

Surface water connectivity was identified between the proposed development and Rye Water Valley/Carton pNHA and the Royal Canal pNHA. This is further described in Section 6.7.2 of this Chapter.

The AA Screening that accompanies this application identifies the following European Sites as being within the Likely Zone of Impact:

Rye Water Valley/Carton SAC [001398]
South Dublin Bay SAC [000210]
North Dublin Bay SAC [000206]
South Dublin Bay and River Tolka Estuary SPA [004024]
North Bull Island SPA [004006].

6.5.1.2 NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the National Juniper Survey, Irish Semi-Natural Grassland Survey, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets were conducted prior to undertaking the multi-disciplinary walkover survey.

The closest mapped article 17 habitats are Alkaline Fen and Alluvial woodland located 5km and 5.1km east of the development site, as shown in Figure 6-5.

Map Legend

- EIAR Site Boundary
- Article 17 Alluvial Woodland

N

Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title
NPWS Article 17 mapped habitat in relation to proposed development site

Project Title
Sky Castle Ltd – Moygaddy Mixed Use Scheme, Co. Meath & Co. Kildare

Drawn By	Checked By
CM	CM
Project No.	**Drawing No.**
210414	Figure 6-5
Scale	**Date**
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6.5.1.3 New Flora Atlas

A search was made in the New Atlas of the British and Irish Flora (Preston *et al*, 2002) to investigate whether any rare or unusual plant species listed under Annex I of the EU Habitats Directive, The Irish Red Data Book, 1, Vascular Plants (Curtis, 1988) or the Flora (Protection) Order ((FPO)1999, as amended 2015) had been recorded in the relevant 10km squares in which the study site is situated (N93). Each hectad contains 100 whole 1km squares containing terrestrial habitats. Species of conservation concern are given in Table 6-5.

Table 6-5 Species listed designated under the Flora Protection Order or the Irish Red Data Book within Hectad N93

Common Name	Scientific Name	Status
Red Hemp-nettle	*Galeopsis angustifolia*	VU, FPO
Opposite-leaved Pondweed	*Groenlandia densa*	NT, FPO
Hairy St John's-wort	*Hypericum hirsutum*	VU, FPO
Hairy Violet	*Viola hirta*	VU, FPO
Shepherd's-needle	*Scandix pecten-veneris*	RE
Green-winged Orchid	*Orchis morio*	VU
Upright Brome	*Bromopsis erecta*	NT
Greater Knapweed	*Centaurea scabiosa*	NT
Autumn Gentian	*Gentianella amarella*	NT
Corn Marigold	*Chrysanthemum segetum*	NT
Henbane	*Hyoscyamus niger*	NT
Pale Flax	*Linum bienne*	NT

6.5.1.4 National Biodiversity Data Centre (NBDC) Records

A search of the National Biodiversity Data Centre (NBDC) records for the relevant hectad, N93, provided records on a number of fauna species of conservation concern, excluding marine species and bird species. These are provided in Table 6-6. Records on invasive are also provided and outlined in Table 6-7.

Table 6-6 NBDC Records for Species of Conservation Interest in hectad N93
Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA - Wildlife Acts – Irish Wildlife Acts (1976, 2017), LC – Least concern, NT – Near threatened, VU - Vulnerable.

Common Name	Scientific Name	Status	Hectad
Common Frog	*Rana temporaria*	Annex V, WA	N93
Smooth Newt	*Lissotriton vulgaris*	WA	N93
Freshwater White-clawed Crayfish	*Austropotamobius pallipes*	Annex II, Annex V, WA	N93

Common Name	Scientific Name	Status	Hectad
Desmoulin's Whorl Snail	*Vertigo moulinsiana*	Annex II, WA	N93
Narrow-mouthed Whorl Snail	*Vertigo angustior*	Annex II, WA	N93
Brown Long-eared Bat	*Plecotus auritus*	Annex IV, WA	N93
Daubenton's Bat	*Myotis daubentonii*	Annex IV, WA	N93
Eurasian Badger	*Meles meles*	WA	N93
Eurasian Pygmy Shrew	*Sorex minutus*	WA	N93
Eurasian Red Squirrel	*Sciurus vulgaris*	WA	N93
European Otter	*Lutra lutra*	Annex II, Annex IV, WA	N93
Lesser Noctule	*Nyctalus leisleri*	Annex IV, WA	N93
Natterer's Bat	*Myotis nattereri*	Annex IV, WA	N93
Pine Marten	*Martes martes*	Annex V, WA	N93
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	Annex IV, WA	N93
Red Deer	*Cervus elaphus*	WA	N93
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Annex IV, WA	N93
West European Hedgehog	*Erinaceus europaeus*	WA	N93
Whiskered Bat	*Myotis mystacinus*	Annex IV, WA	N93

Table 6-7 NBDC records for Invasive Species in hectad F92

Common Name	Scientific Name
American mink	*Mustela vison*
Japanese knotweed	*Fallopia japonica*
Giant rhubarb	*Gunnera tinctoria*
Rhododendron	*Rhododendron ponticum*

6.5.1.5 NPWS

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectad F92. An information request was also sent to the NPWS requesting records from the Rare and Protected Species Database. Table 6-8 lists rare and protected species records obtained from NPWS, as received on the 27th of May 2021, as well as those recorded available through the online NPWS map viewer.

Table 6-8 National Parks and Wildlife Service Map Viewer Records for hectad N93

Common Name	Scientific Name	Designation	Status
Henbane	*Hyoscyamus niger*	Near Threatened (NT)	N93
Red Hemp-Nettle	*Galeopsis angustifolia*	FPO, Vulnerable (VU)	N93
Hairy Violet	*Viola hirta*	FPO, VU	N93
Green Figwort	*Scrophularia umbrosa*	NT	N93
Corn Chamomile	*Anthemis arvensis*	RL	N93
Opposite-leaved Pondweed	*Groenlandia densa*	Annex II, NT, FPO	N93
Shepherd's-needle	*Scandix pecten-veneris*	Regionally Extinct (RE)	N93
Hairy St John's-wort	*Hypericum hirsutum*	FPO, VU	N93
Green-winged Orchid	*Orchis morio*	Annex II, VU	N93
West European Hedgehog	*Erinaceus europaeus*	WA	N93
Irish Hare	*Lepus timidus subsp. Hibernicus*		N93
Badger	*Meles meles*	WA	N93
Irish Stoat	*Mustela erminea subsp. hibernica*		N93
Common Frog	*Rana temporaria*	Annex V, WA	N93
Freshwater Crayfish	*Austropotamobius pallipes*	Annex II, Annex V, WA	N93
Smooth Newt	*Lissotriton vulgaris*	WA	N93
Narrow-mouther Whorl Snail	*Vertigo angustior*	Annex II, VU	N93
Desmoulin's Whorl Snail	*Vertigo moulinsiana*	Annex II, Endangered (EN)	N93

6.5.1.6 Inland Fisheries Ireland (IFI) Data

Monitoring of the Rye River catchment is carried out as part of the East River Basin District River Surveys. The most recent IFI surveys were carried out between 14th and 20th of September 2018, with three locations along the River Rye in total being surveyed.

Only one out of the three surveyed sites achieved Good ecological status. The other two surveyed sites have declined in status since 2011, changing from a good to a moderate status. Five fish species were recorded at three sites surveyed on the Rye Water River Catchment in 2018. Minnow was the most abundant species captured. Brown trout were recorded at all three sites fish and ranged in length from 6.8 to 31.5cm. Four age classes of brown trout, 0+, 1+, 2+ and 3+, were present. Lamprey and pike were recorded at one site only (site 3) (Matson et al., 2019).

6.5.1.7 Water Quality

River Basin Management Plans (RBMPs) have been published for all River Basin Districts in Ireland in accordance with the requirements of the Water Framework Directive. The online EPA Envision map viewer provides access to water quality information at individual waterbody status for all the River Basin Districts in Ireland. The EPA Envision map viewer was consulted, most recently, on 23rd of March 2022 regarding the water quality status of the rivers which run adjacent to the Study Area. The WFD River Waterbody Status 2013 – 2018 for the watercourses which flow through the site have been assessed in Table 6-9.

Table 6-9 Watercourses on site with relevant water quality statuses

Name	Location	Status	Risk
Rye Water River	Flows along the southern boundary of the health application site	Moderate	At Risk
Blackhall Little River	Flows along the western of the employment application site	Moderate	At Risk

Status– WFD River Waterbody Status 2010-2015 Risk – WFD River Waterbodies Risk

6.5.2 Conclusions of the Desk Study

The desktop study has provided information about the existing environment in Hectad N93, within which the proposed development site is located. the Proposed Development site is located in the Rye Water_30 river sub basin.

The Rye Water River which flows in an easterly direction outside the southern site boundary. The Rye Water River is designated as part of the Rye Water Valley/Carton SAC. The desktop study has provided information about the existing environment in Hectad N93 within which the Proposed Development site is located.

A number of watercourses that drain the study area, lead to the following downstream EU Designated Sites, and are further considered in the Natura Impact Statement prepared for the Proposed Development:

Rye Water Valley/Carton SAC [001398]
South Dublin Bay SAC [000210]
North Dublin Bay SAC [000206]
South Dublin Bay and River Tolka Estuary SPA [004024]
North Bull Island SPA [004006].

The desk study identified that a variety of protected faunal species are known to occur within the study area, including bats, otter, red squirrel, pine marten and badger. The mammal species recorded during the desk study informed the survey methodologies undertaken during the site visits.

The desk study also provided useful information to inform the ecological surveys undertaken on site as well as the identification of pathways for potential impact on sensitive ecological receptors.

6.6 Description of the Existing Environment

6.6.1 Description of Habitats

A dedicated habitat survey of the proposed development site was undertaken on the 6th of July by Julie O'Sullivan and Colin Murphy, with follow up surveys carried out in July 2022. All habitats within the development site were readily identifiable during the site visit. The habitat classifications and codes correspond to those described in '*A Guide to Habitats in Ireland*' (Fossitt, 2000).

The following section describes the habitats found within the 6 separates planning application sites (Site, A, Site B, Site C, MOOR, Kildare bridge and Moyglare Bridge).

A habitat map of the entire proposed development site is shown in figure 6.6.

6.6.1.1 Site A- Strategic Employment Zone

Table 6-10. Habitats recorded in Site A

Habitat (Fossitt)	Code
Improved Agricultural Grassland	*GA1*
Hedgerows	*WL1*
Treeline	*WL2*
Buildings and Artificial Surfaces	*BL3*

Improved Agricultural Grassland (GA1) is the dominant habitat within the development site. This habitat had a low species diversity and a low sward height, and during the survey was being grazed by sheep and horses. Species recorded in this habitat included abundant perennial rye-grass (*Lolium perenne*), clovers (*Trifolium* spp.), broadleaved plantain (*Plantago major*), frequent ribwort plantain (*Plantago lanceolata*). creeping buttercup (*Ranunculus repens*), annual meadow grass (*Poa annua*), daisy (*Bellis perennis*), cock's-foot (*Dactylis glomerata*), crested dogs tail (*Cynosurus cristatus*), meadow foxtail (*Alopecurus pratensis*), Yorkshire fog (*Holcus lanatus*), nettle (*Urtica dioica*), dandelion (*Taraxacum officinale* agg.), broad-leaved dock (*Rumex obtusifolius*), mouse-ear chickweed (*Cerastium fontanum*), creeping thistle (*Cirsium arvense*) and germander speedwell (*Veronica chamaedrys*). See Plate 6.1.

Field boundaries are delineated by mature ***Treelines (WL2)*** and ***Hedgerows (WL1).*** Species recorded in the treelines (WL2) include oak, ash, sycamore, hawthorn and beech and was recorded along the southern boundary of the site. Species recorded in the hedgerows (WL1) and hedgerow understory included elder (*Sambucus nigra)*, hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), bramble (*Rubus fructicosus*), willows (*Salix* spp.), holly (*Ilex aquilifolium*), ash (*Fraxinus excelsior*) and ivy (*Hedera helix*). Species recorded in the field margins and hedgerow understory included common sorrel (*Rumex acetosa*), meadow buttercup (*Ranunculus acris*), herb Robert (*Geranium robertianum*), *harts tongue fern (Asplenium scolopendrium*), dandelion (*Taraxacum officinale* agg.), primrose (*Primula vulgaris*), vetch (*Vicia* spp.), lesser celandine (*Ficaria verna*), lords and ladies (*Arum maculatum*) and creeping cinquefoil (*Potentilla reptans).* See plate 6.2.

Remnant dried up former drainage ditches occur in parts of the site bordering hedgerows and treelines in the north-west of the site. These former drainage ditches had dried up, had no flow and were heavily vegetated with dense bramble and nettles.

The R157 located along the eastern boundary of the proposed development site is categorized as Buildings and Artificial Surfaces (BL3). See Plate 6.3.

There are no Annex I habitats listed under the EU Habitats Directive present within the Proposed development site boundary. No botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data

Books were recorded on the site and no suitable habitat occurs within the site. All species recorded are common in the Irish landscape.

Plate 6-1.Agricultural grassland recorded within development site A.

Plate 6-2. Hedgerow habitat along the eastern boundary of site A

Plate 6-3. R157 located along the eastern boundary of Site A.

6.6.1.2 Site B- Healthcare Facilities

Table 6-11. Habitats recorded within development site B.

Habitat (Fossitt)	Code
Improved Agricultural Grassland	*GA1*
Hedgerows	*WL1*
Treeline	WL2
Eroding/upland Rivers	*FL2*
Buildings and Artificial Surfaces	*BL3*

Improved Agricultural Grassland (GA1) is the dominant habitat within the development site. This habitat had a low species diversity and a low sward height, and during the survey was being grazed by sheep and horses. Species recorded in this habitat included abundant perennial rye-grass (*Lolium perenne*), clovers (*Trifolium* spp.), broadleaved plantain (*Plantago major*), frequent ribwort plantain (*Plantago lanceolata*). creeping buttercup (*Ranunculus repens*), annual meadow grass (*Poa annua*), daisy (*Bellis perennis*), cock's-foot (*Dactylis glomerata*), crested dogs tail (*Cynosurus cristatus*), meadow foxtail (*Alopecurus pratensis*), Yorkshire fog (*Holcus lanatus*), nettle (*Urtica dioica*), dandelion (*Taraxacum officinale* agg.), broad-leaved dock (*Rumex obtusifolius*), mouse-ear chickweed (*Cerastium fontanum*), creeping thistle (*Cirsium arvense*) and germander speedwell (*Veronica chamaedrys*). See Plate 6.4.

Field boundaries are delineated by mature ***Treelines (WL2)*** and ***Hedgerows (WL1).*** Species recorded in the treelines (WL2) include oak, ash, sycamore, hawthorn and beech and was recorded along the southern boundary of the site. Species recorded in the hedgerows (WL1) and hedgerow understory included elder (*Sambucus nigra)*, hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), bramble (*Rubus fructicosus*), willows (*Salix* spp.), holly (*Ilex aquilifolium*), ash (*Fraxinus excelsior*) and ivy (*Hedera helix*). Species recorded in the field margins and hedgerow understory included common sorrel (*Rumex acetosa*), meadow buttercup (*Ranunculus acris*), herb Robert (*Geranium robertianum*), *harts tongue fern (Asplenium scolopendrium*), dandelion (*Taraxacum officinale* agg.), primrose (*Primula vulgaris*), vetch (*Vicia* spp.), lesser celandine (*Ficaria verna*), lords and ladies (*Arum maculatum*) and creeping cinquefoil (*Potentilla reptans).* See plate 6.5.

Remnant dried up former drainage ditches occur in parts of the site bordering hedgerows and treelines in the north-west of the site. These former drainage ditches had dried up, had no flow and were heavily vegetated with dense bramble and nettles.

The Rye Water River flows along the southern boundary of the site and is categorised as Eroding/upland River. The river is fringed by a mature treeline on its northern banks, which also forms part of the development boundary. See plate 6.6.

The R157 located along the eastern boundary of the proposed development site is categorized as Buildings and Artificial Surfaces (BL3).

There are no Annex I habitats listed under the EU Habitats Directive present within the Proposed development site boundary. No botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site and no suitable habitat occurs within the site. All species recorded are common in the Irish landscape.

Plate 6-4. Agricultural grassland recorded in site B.

Plate 6-5. Hedgerow recorded in eastern section of site B.

Plate 6-6. Rye Water River along recorded along the southern boundary of site B.

6.6.1.3 Site C- Strategic Housing Development

Table 6-12. Habitats recorded on the proposed development site.

Habitat (Fossitt)	Code
Improved Agricultural Grassland	*GA1*
Buildings and Artificial Surfaces	BL3
Mixed broadleaved woodland	*WD1*
Eroding upland River	FW1
Hedgerows	*WL1*
Treeline	*WL2*

Improved Agricultural Grassland (GA1) is the dominant habitat within the site C. This habitat had a low species diversity and a low sward height, and during the survey was being grazed by sheep and horses. Species recorded in this habitat included abundant perennial rye-grass (*Lolium perenne*), clovers (*Trifolium* spp.), broadleaved plantain (*Plantago major*), frequent ribwort plantain (*Plantago lanceolata*). creeping buttercup (*Ranunculus repens*), annual meadow grass (*Poa annua*), daisy (*Bellis perennis*), cock's-foot (*Dactylis glomerata*), crested dogs tail (*Cynosurus cristatus*), meadow foxtail (*Alopecurus pratensis*), Yorkshire fog (*Holcus lanatus*), nettle (*Urtica dioica*), dandelion (*Taraxacum officinale* agg.), broad-leaved dock (*Rumex obtusifolius*), mouse-ear chickweed (*Cerastium fontanum*), creeping thistle (*Cirsium arvense*) and germander speedwell (*Veronica chamaedrys*). See Plate 6.7.

Moygaddy castle in the northern section of the site is classified as ***Buildings and Artificial Surfaces (BL3)***. See plate 6.8.

Field boundaries are delineated by mature ***Treelines (WL2)*** and ***Hedgerows (WL1).*** Species recorded in the treelines (WL2) include oak (*Quercus sp.*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus),* hawthorn (*Crataegus monogyna*) and beech (*Fagus sylvatica*) and was recorded along the southern boundary of the site. Species recorded in the hedgerows (WL1) and hedgerow understory included elder (*Sambucus nigra)*, hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus*), willows (*Salix* spp.), holly (*Ilex aquilifolium*), ash (*Fraxinus excelsior*) and ivy (*Hedera helix*). Species recorded in the field margins and hedgerow understory included common sorrel (*Rumex acetosa*), meadow buttercup (*Ranunculus acris*), herb Robert (*Geranium robertianum*), *harts tongue fern (Asplenium scolopendrium*), dandelion (*Taraxacum officinale* agg.), primrose (*Primula vulgaris*), vetch (*Vicia* spp.), lesser celandine (*Ficaria verna*), lords and ladies (*Arum maculatum*) and creeping cinquefoil (*Potentilla reptans).* See plate 6.9.

Remnant dried up former drainage ditches occur in parts of the site bordering hedgerows and treelines in the north-west of the site. These former drainage ditches had dried up, had no flow and were heavily vegetated with dense bramble and nettles.

The Blackhall Little River, classified as **Eroding/upland river (FW1)** flows through the site, in a southerly direction ((See plate 6.10), discharging to the Rye Water River which flows in an easterly direction outside the southern site boundary. The Rye Water River is designated as part of the Rye Water Valley/Carton SAC, downstream of the proposed development site.

The Blackhall Little is characterized by a rocky substrate, with some pool, riffle and glide areas. The river is approximately 1-2m in the southern section of the site. At the time of the field survey, the river had a low flow and the water was slightly turbid. The river is fringed by mature treeline/hedgerow on its eastern bank and improved agricultural grassland on is western bank. The western embankment of the river had a low profile and had evidence of cattle poaching in places. Emergent vegetation included watercress (*Nasturtium officinale),* wild angelica (*Angelica sylvestris)*, marsh marigold (*Caltha palustris*), meadow buttercup (*Ranunculus acris*) and fools water cress (*Apium nodiflorum).* Willow (*Salix* spp.) and bramble (*Rubus fructicosus)* occur along the embankment.

Mixed broadleaved woodland (WD1) occurs on either side of the Blackhall Little River in the centre of the site. This woodland has been planted and is approximately 20-25 years old. The topography of the wooded area, slope down toward the river. See plate 6.11.

The mixed broadleaved woodland (WD1) on the eastern shore of the river, is dominated by mature beech trees, and had a low diversity of species in the ground flora. The woodland on the western shoreline of the watercourse was recently planted with ash, beech and oak, with sycamore also present. The ground flora included abundant nettle, hogweed, herb Robert, ground elder, ivy and wood avens with frequent *poa trivialis*, goosegrass, *ranunculus repens*, foxtail, dock, and cow parsley.

There are no Annex I habitats listed under the EU Habitats Directive present within the Proposed development site boundary. No botanical species protected under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site and no suitable habitat occurs within the site. All species recorded are common in the Irish landscape.

Plate 6-7. Improved agricultural grassland in centre of site C.

Plate 6-8.Moygaddy castle, categorized as Buildings and Artificial surfaces in the north section of site C.

Plate 6-9.Hedgerow habitat delineating improved agricultural grassland (GA1) in the centre of the site.

Plate 6-10.Blackhall Little River categorised as eroding upland river in the centre of site C.

Plate 6-11.Mixed Broadleaved woodland planted with Ash, Beech and Sycamore located in the centre of site C.

6.6.1.4 MOOR (Maynooth Outer Orbital Road) Site

Table 6-13. Habitats recorded within the MOOR application site.

Habitat (Fossitt)	Code
Improved Agricultural Grassland	*GA1*
Buildings and Artificial Surfaces	BL3
Eroding upland River	FW1
Hedgerows	*WL1*
Treeline	*WL2*

Improved Agricultural Grassland (GA1) is the dominant habitat within the MOOR application site boundary. This habitat had a low species diversity and a low sward height, and during the survey was being grazed by sheep and horses. Species recorded in this habitat included abundant perennial rye-grass (*Lolium perenne*), clovers (*Trifolium* spp.), broadleaved plantain (*Plantago major*), frequent ribwort plantain (*Plantago lanceolata*). creeping buttercup (*Ranunculus repens*), annual meadow grass (*Poa annua*), daisy (*Bellis perennis*), cock's-foot (*Dactylis glomerata*), crested dogs tail (*Cynosurus cristatus*), meadow foxtail (*Alopecurus pratensis*), Yorkshire fog (*Holcus lanatus*), nettle (*Urtica dioica*), dandelion (*Taraxacum officinale* agg.), broad-leaved dock (*Rumex obtusifolius*), mouse-ear chickweed (*Cerastium fontanum*), creeping thistle (*Cirsium arvense*) and germander speedwell (*Veronica chamaedrys*). See Plate 6.12.

The R157 located to the east of the site and the L2214 located within the centre of the site are both categorized as **Buildings and Artificial Surfaces (BL3).**

The MOOR application intersects multiple fields that are delineated by mature **Treelines (WL2)** and **Hedgerows (WL1).** Species recorded in the treelines (WL2) include oak (*Quercus sp.*), ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), hawthorn (*Crataegus monogyna*) and beech (*Fagus sylvatica*) and was recorded along the southern boundary of the site. Species recorded in the hedgerows (WL1) and hedgerow understory included elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), bramble (*Rubus fruticosus*), willows (*Salix spp.*), holly (*Ilex aquilifolium*), ash (*Fraxinus excelsior*) and ivy (*Hedera helix*). Species recorded in the field margins and hedgerow understory included common sorrel (*Rumex acetosa*), meadow buttercup (*Ranunculus acris*), herb Robert (*Geranium robertianum*), harts tongue fern (*Asplenium scolopendrium*), dandelion (*Taraxacum officinale agg.*), primrose (*Primula vulgaris*), vetch (*Vicia spp.*), lesser celandine (*Ficaria verna*), lords and ladies (*Arum maculatum)* and creeping cinquefoil (*Potentilla reptans*). See plate 6.13 and 6-14.

The proposed MOOR route intersects the Rye Water River to the east of the route and the Blackhall Little River to the north of the route. Both rivers are categorized as **Eroding Upland River (FW1)**. It should be noted that during the 2022 site survey, the Blackhall Little River had largely dried up and there was no flowing water present. See plate 6.15 & 6.16.

Plate 6-12. Improved agricultural grassland located within the route of the MOOR application.

Plate 6-13. L2214 categorized as Buildings and Artificial surfaces located within route of the proposed MOOR fringes by mature Treeline habitat

Plate 6-14. Treeline recorded along the Blackwater Little River within the centre of the MOOR route

Plate 6-15. Blackhall Little River with no flowing water located to the north of the MOOR route

Plate 6-16. Rye Water River located to the western boundary of the MOOR route

6.6.1.5 Kildare Bridge

The habitats described below refer to the habitats recorded within the boundary of the Kildare bridge application.

Table 6-14. Habitats recorded within the Kildare bridge application site.

Habitat (Fossitt)	Code
Buildings and Artificial Surfaces	BL3
Treeline	*WL2*
Eroding upland River	*FW1*

The Kildare bridge, R157 and the Dunboyne Road are all categorized as Buildings and artificial (BL3). See plate 6.18.

Plate 6-17. Kildare bridge and R157

The Rye Water River located at the bridge is categorized as Eroding upland River (FW1) and is fringed by riparian Treeline (WL1) with Sycamore (*Acer pseodoplatanus*), Ash (*Fraxinus excelsior*), Willow (*Salix sp.)* and *Leyandii cypress* occurring here. See Plate 6-19.

Plate 6-18. Rye River (FW1) fringed by riparian Treeline (WL1).

6.6.1.6 Moyglare Bridge

The habitats described below refer to the habitats recorded with the Moyglare Bridge application site.

Table 6-15. Habitats recorded within the Moyglare bridge site

Habitat (Fossitt)	Code
Spoil and Bare ground	*ED2*
Dry Meadows and grassy verges	*GS2*
Eroding upland River	*FW1*

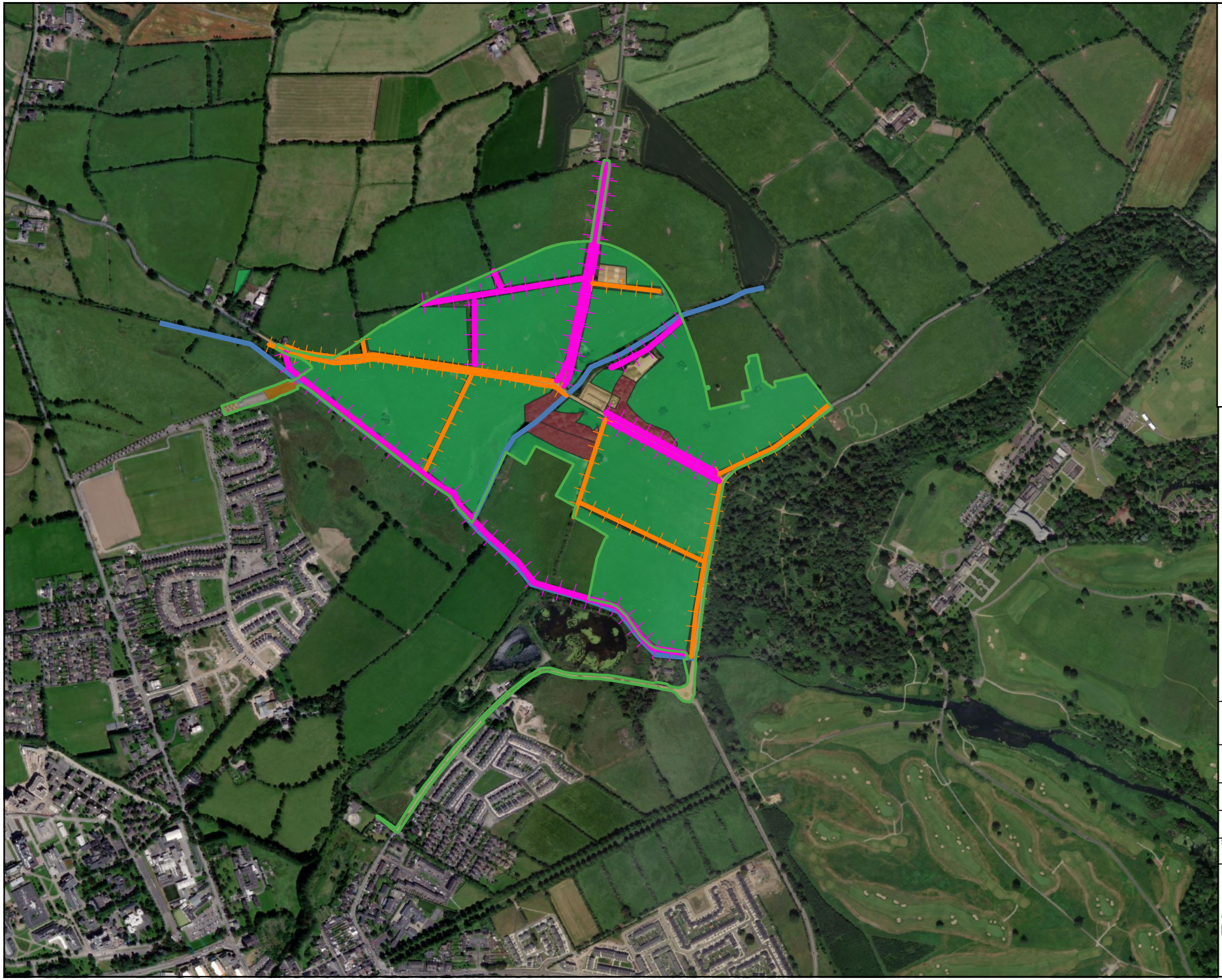
The area to the south of the Rye Water River is dominated by rank grassland categorised as Dry Meadows and grassy verges (GS2). The species diversity here was low and dominated by tussocky vegetation composing of Broad-leaved dock (*Rumex obtusifolius*), Ragwort (*Jacobaea vulgaris*), Creeping thistle (*Cirsium arvense*), Yorkshire fog (*Holcus lanatus*) and Cock's foot (*Dactylis glomerata*). See Plate 6-19. A small section of Spoil and bare ground (ED2) habitat was recorded to the south of the Moyglare Bridge-Kildare application boundary, in the area adjacent to the Moyglare Hall Estate. See Plate 6-20.

The Rye Water River occurs at the northern boundary of the Moyglare Bridge-Kildare application site and is categorised as Eroding upland River (FW1). See Plate 6-21.

Plate 6-19. Dry meadows and grassy Verges habitat recorded south of the Rye Water River within Moyglare site

Plate 6-20. Spoil and bare ground fringed by dry meadows and grassy verges within Moyglare site

Plate 6-21. Rye Water River categorised as Eroding upland river within Moyglare site.



Map Legend

EIAR Site Boundary

Habitat Map

- Buildings and Artificial Surfaces (BL3)
- Improved Agriculltural Grassland (GA1)
- MIxed Broadleaved Woodland (WD1)
- Spoil and Bare Ground (ED2)
- Dry Meadows and Grassy Verges (GS2)

Linear habitat

- Eroding Upland River (FW2)
- Hedgerow (WL1)
- Treeline (WL2)

N

Drawing Title

Habitat Map

Project Title

Sky Castle Ltd – Moygaddy Mixed Use Scheme, Co. Meath & Co. Kildare

Drawn By	Checked By
CM	CM
Project No.	Drawing No.
210414	Figure 6-6
Scale	Date
1:12,170	2022-08-30

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6.6.2 Invasive species

During field surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted. No species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded during the survey.

6.6.3 Protected Flora

No botanical species listed under the Flora (protection) Order (1999, as amended 2015), listed in the EU Habitats Directive (92/43/EEC), or listed in the Irish Red Data Books were recorded on the site. All species recorded are common in the Irish landscape. No rare and protected plant species recorded in the desk study, including those obtained from NPWS data request (see Table 6-8), were recorded within the study area.

6.6.4 Rye Water Valley/Carton SAC Survey

A survey of the area to the east of Kildare bridge designated as part of Rye Water Valley/Carton House SAC was undertaken on the 21st of July 2022. During the survey, the area was extensively searched for any Petrifying springs with tufa formation (Cratoneurion) [7220], listed as a QI habitat for Rye Water Valley/Carton House SAC. No Petrifying springs with tufa formation (Cratoneurion) were discovered during the survey.

6.6.5 Fauna

6.6.5.1 Birds

Bird species recorded within the site boundaries during the site visit were an assemblage of common birds that are typical of the urban habitats in the wider area. A total of ten bird species were recorded within or flying over the site during the site visits (Table 6-11).

No evidence of Annex I or Special Conservation Interest (SCI) bird species associated with any SPA was recorded within the site boundaries. Given the lack of suitable habitat for rare or protected bird species identified within the site, there is no requirement for further bird surveys at the site.

Table 6-16 Bird species observed during the field visit, and current conservation status.

Common Name	Latin Name	Conservation Status
Robin	*Erithacus rubecula*	Green
Chaffinch	*Fringilla coelebs*	Green
Woodpigeon	*Columba palumbus*	Green
Rook	*Corvus frugilegus*	Green
Magpie	*Pica pica*	Green
Wren	*Troglodytes troglodytes*	Green
Buzzard	*Buteo buteo*	Green
Blackbird	*Turdus merula*	Green
Blue tit	*Parus caeruleus*	Green

Common Name	Latin Name	Conservation Status
Dunnock	*Prunella modularis*	Green

6.6.5.2 Barn Owl survey results

The nocturnal vantage point survey did not indicate evidence of breeding barn owls and the building was considered 'unoccupied'. An interior inspection of the building was carried out once it was established that the building was unoccupied, to look for evidence indicating barn owl occupancy, including pellets, white-wash and moulted feathers. Particular attention was paid to the area under suitable cavities, both inside and outside of the building.

6.6.5.3 Bat Survey

Bat walkover surveys of the wider study area (Moygaddy Masterplan Area) were carried out during daylight hours on the 8th July, 22nd July and 9th August 2021. The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) (Collins, 2016). Table 4.1 of the 2016 BCT Guidelines identifies a grading protocol for assessing structures, trees and commuting/foraging habitat for bats. The protocol is divided into four Suitability Categories: *High, Moderate, Low* and *Negligible.*

Full details of the bat survey effort and results can be found in the bat report located in Appendix 6-1

Roost Surveys

Moygaddy Castle

A dedicated exterior roost inspection survey was undertaken during daylight hours on 8th of July 2021. The tower castle is two to three stories and approximately 30 feet tall. The tower consists of stone walls and a partially collapsed stone roof. The interior of the structure was accessible through the main door at the ground level and the multiple windows on the first floor. The PRF's consisted of ivy cover over outer walls and a large number of crevices in the stonework. Gaps with potential for roosting bats were present between the stonework. The ivy cover was extensive along the south facing wall. Due to the number of PRF's, the tower was identified as having *"High suitability"* potential for roosting bats, i.e. a structure with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat (Collins, 2016). No evidence of bat use, including droppings, fur oil staining, signs of feeding remain etc., were identified within or surrounding the building. No bats were observed exiting or entering the building during the dusk activity survey.

Kildare Bridge

A dedicated exterior roost inspection survey was undertaken on Kildare bridge (Grid Ref: N 94726 38561) during daylight hours on 18th of August 2022. The bridge did not provide any significant suitable roosting features and no evidence of bats or bat use was found during the inspection. As such, it was classified as "Negligible" to "Low" Suitability for roosting bats.

Dusk/Dawn Activity

Numerous foraging and commuting bats were recorded during the dusk and dawn bat activity surveys. Overall, bat activity was low with a total of 521 bat passes recorded across all surveys. Activity was dominated by common pipistrelle (Pipistrellus pipistrellus) n=293. This was followed by Leisler's bat (*Nyctalus leisleri*) n=159 and soprano pipistrelle (Pipistrellus pygmaeus) n=67. In addition, very small numbers of brown long-eared bat (*Plecotus auritus*) n=2 were also recorded. Activity levels were concentrated along the treeline edge habitats and field boundary hedgerows bordering the site (Figure 4-1 – 4-3 in bat report in appendix 6-1). Plate 6-4 shows total bat species composition and Table 6-12 presents the results per survey.

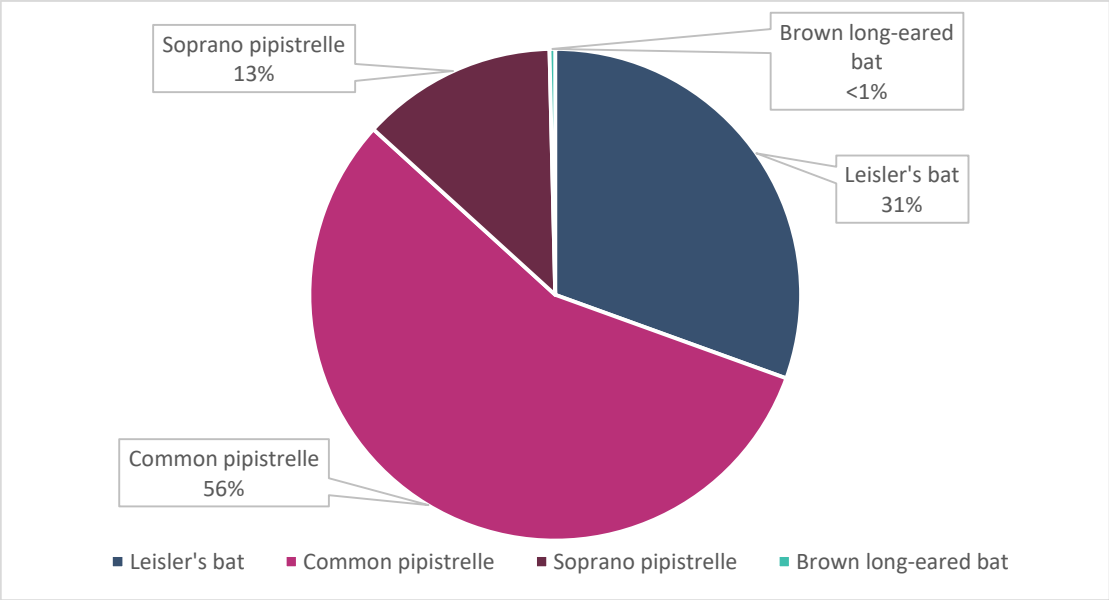

Plate 6-22 Bat Species Composition – Dusk and Dawn surveys

Table 6-17 Manual transect bat pass results per survey.

Species	Dusk 8th July 2021	Dawn 22nd July 2021	Dusk 9th August 2021	Total
Brown long-eared bat	-	-	2	**2**
Leisler's bat	150	6	3	**159**
Common pipistrelle	124	47	122	**293**
Soprano pipistrelle	46	3	18	**67**
Grand Total	**320**	**56**	**145**	**521**

There was an accumulation of bat activity around the small castle tower and surrounding WD1 habitat to the eastern section of Site C. The concentration of activity can be attributed to the surveyors being positioned here for 1.5hours during the emergence survey on the small castle tower. Bats were recorded commuting between the structure and foraging along woodland, hedgerow and treeline boundaries. However, no bats were observed emerging or re-entering the structure. This was followed by walked transects for the remainder of the surveys.

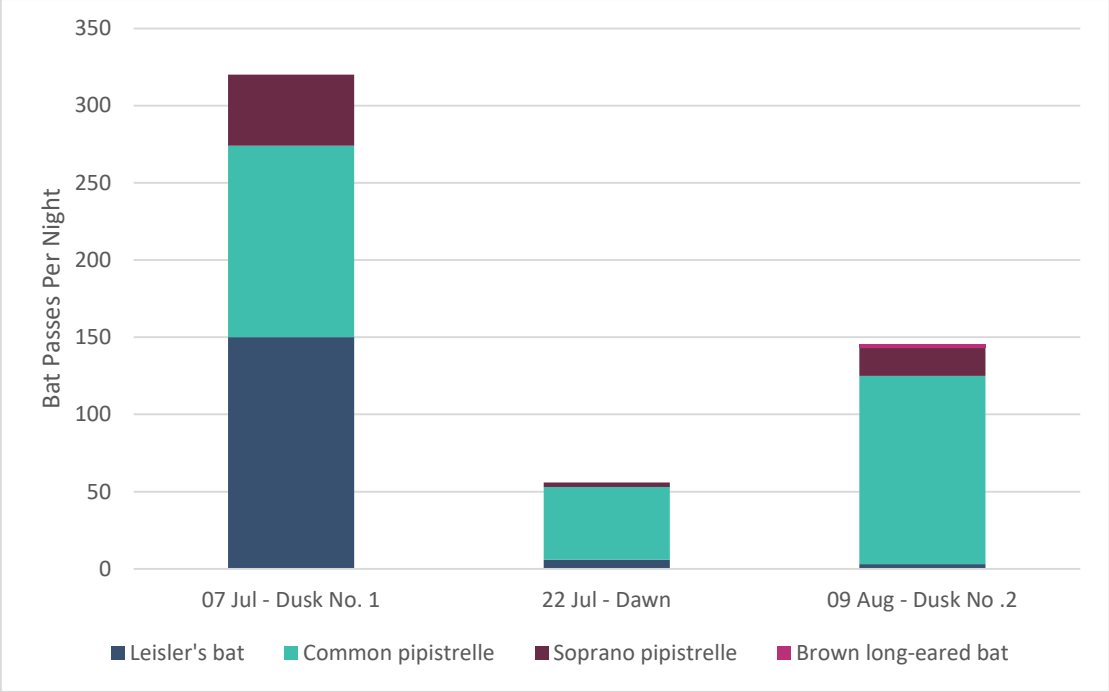

Plate 6-23 Species Composition Per Survey

Static Detector Results

Three static detectors were deployed on the site at six different locations (Figure 3-1 found in the bat report included as Appendix 6-1 of this EIAR), based on likely areas of bat activity, for a total of 33 nights in July/August 2021. These detectors allowed a specified look into species composition, commuting and foraging activities within the site.

All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.4.2 (Wildlife Acoustics, MA, USA). Bat species were identified using established call parameters, to create site-specific custom classifiers. All identified calls were also manually verified. In total, 20,160 bat passes were recorded.

Analysis of the detector recordings positively identified five bats to species level with Myotis genus also present. Bat species included: common pipistrelle (*Pipistrellus pipistrellus*) n=10,061, Leisler's bat (*Nyctalus leisleri*) n=6,062 and soprano pipistrelle (*Pipistrellus pygmaeus*) n=3,596. Myotis spp. n=276, brown long-eared bat (*Plecotus auritus*) n=97 and nathusius' pipistrelle (*Pipistrellus nathusii*) were rarely encountered, with 1% or less compared to the total bats recorded Plate 6-6.

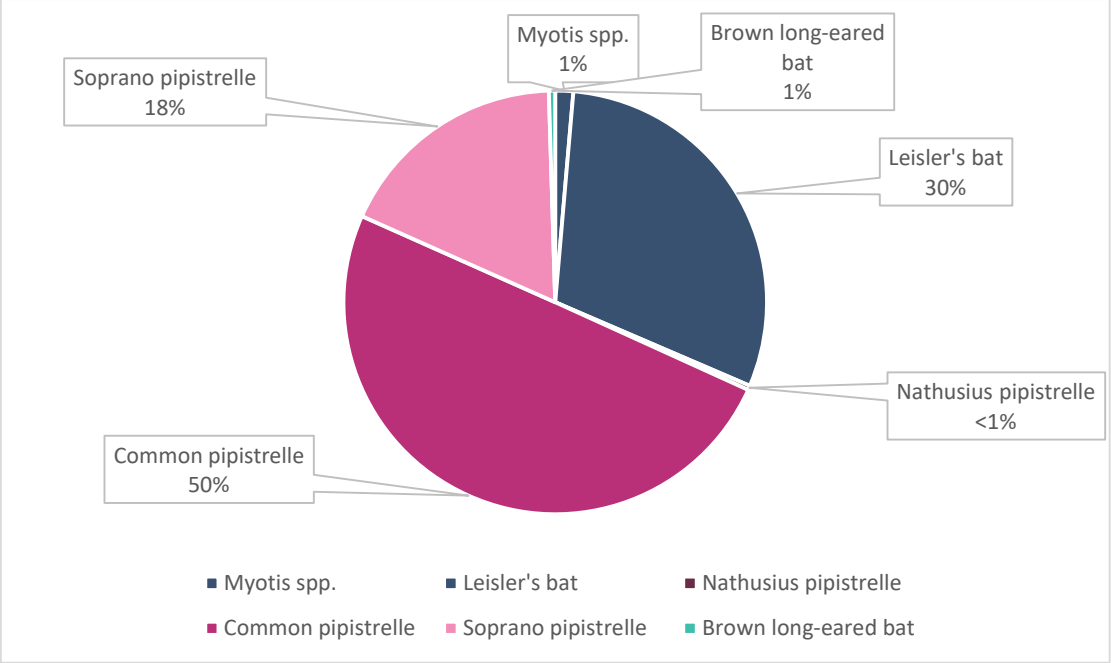

Plate 6-24 Species composition

Plate 6-9 shows total bat passes per detector. Detectors D01, D02 and D03 are associated with the first two-week deployment from 8th July to 22nd July 2021. Detector D01 was located to the northeast of Site C along a birch treeline habitat next to and open grassland. Detector D02 was located to the southeast of Site C along a treeline edge habitat, adjacent to the stream running north to south through the Study Area. Detector D03 was located along the hedgerow in the northwest of the Maynooth Outer Orbital Road (MOOR) Site. This area has a strong linear feature, that could provide suitable commuting and foraging opportunities for bats.

Detectors D04, D05 and D06 are associated with the second two-week deployment from 22nd July to 9th August 2021. Detector D04 was located north of Site A and east of the MOOR Site where two hedgerows converge. This area had high quality linear features suitable for foraging and commuting bats. Detector D05 was located along a hedgerow next to the Rye Water River along the southern boundary of Site C. Detector D06 was located to the northwest of Site C and the MOOR Site. Figure 3-1 shows all static detector locations.

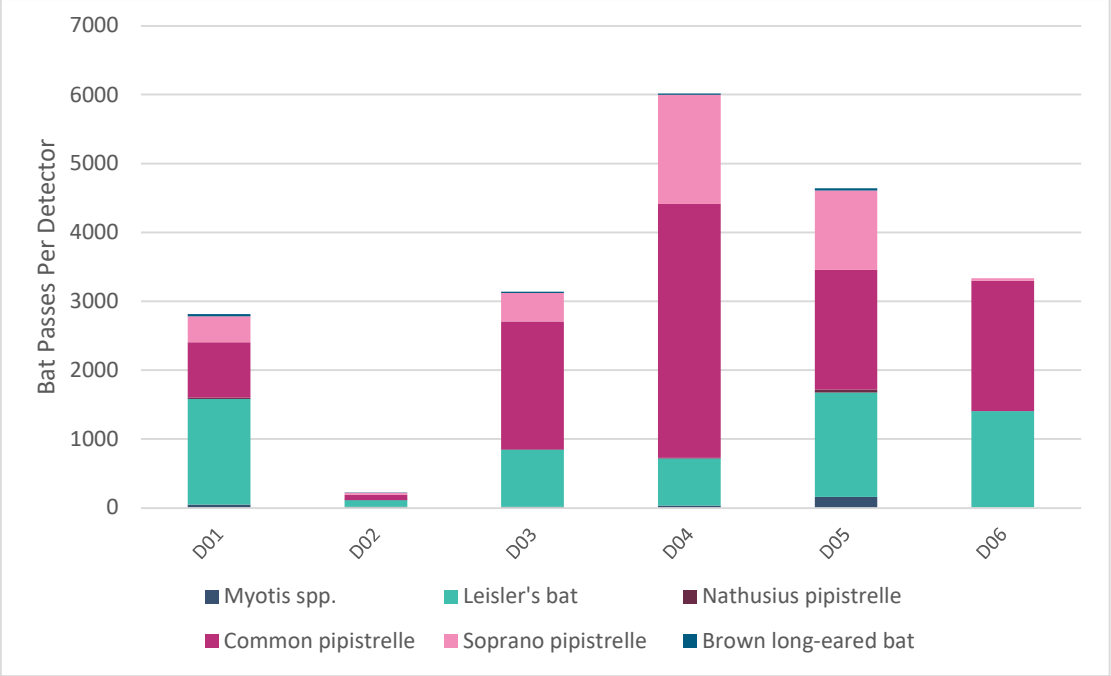

Plate 6-25. Bat Passes Per Detector

Analysis of the detector recordings also highlighted the total bat passes per night. Species composition per night is shown in Plate 6-26. Nights from 1 to 16 are associated with the first deployment locations (D1, D2 and D3). Nights from 17 to 33 include bat passes from the second deployment locations D4, D5 and D6. Activity varied across each deployment and each night. The graph demonstrates that common pipistrelle, Leisler's bat and soprano pipistrelle species were most commonly recorded during the survey periods. These species are common and widespread across Ireland.

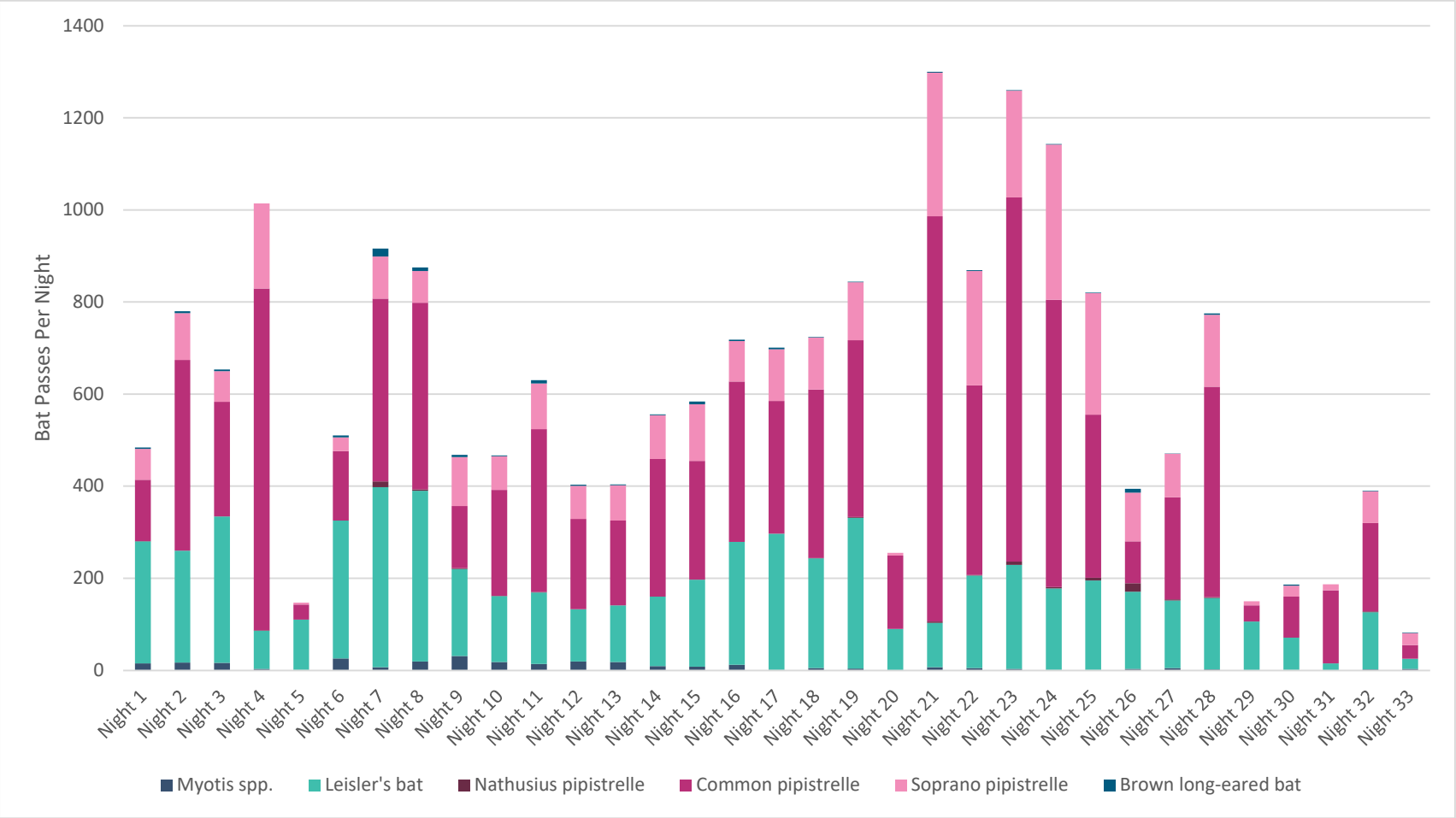

Plate 6-26 Bat Passes per night.

6.6.5.4 Badger

Two potential badger setts were recorded within and along the hedgerow in the centre and along the hedgerow adjacent to the Blackhall Little River in the east section of the of site C (SHD application site). Camera traps were deployed at these burrows on the 6th July-16th August to monitor activity and determine whether any of the setts were being utilised by badgers. The potential badger sett along the hedgerow in the centre of the SHD site did not show signs of recent activity (i.e spoils heaps, fresh bedding, latrines) and looked inactive (See plate 6-24). A camera trap was deployed at this location for two weeks and no badgers were recorded using this sett. as such, it can be determined this is not an active sett but may be used as an outlier sett on occasion.

The potential badger sett observed along the Blackhall Little River showed some signs of activity, with fresh bedding and spoil heaps recorded outside one of the entrances (see plate 6-25). Five potential entrances were recorded at this location. Camera trap footage from this sett also recorded badger activity outside of the entrance of the sett (see plate 6-26). Although no footage was recorded of badgers entering and exiting the sett, it can be assumed this is an active sett due to the signs of activity and the badger recorded on the camera trap. The location of the setts are located in Figure 6-7 found in confidential appendix 6-2.

An additional badger survey was carried out on the 21st of July 2022. Fresh signs of badger activity were recorded at the main badger sett along the Blackhall Little River (i.e bedding outside sett entrance and spoil heaps), confirming this is a main sett in continuous use. No signs of badger activity were recorded on the sett in the centre of the SHD site during the 2022 survey.

No other badgers setts were recorded within the footprint of Site A, Site B, the MOOR, the Moyglare bridge or the Kildare bridge site.

Plate 6-27. Inactive outlier badger sett recorded within the centre of the SHD application site.

Plate 6-28. Active main badger sett recorded along the Blackhall little River to the east of the SHD application site.

Plate 6-29. Badger recorded passing main sett.

6.6.5.5 Otter

The otter survey was focused on the Rye Water River located along the southern boundary of the proposed development site. A potential otter holt was recorded outside the boundary of the proposed development boundary (see plate 6-29) However, the entrance showed no recent signs of activity and looked inactive. The potential otter holt is located outside the footprint of the development and will not be impacted by construction works. The location of the holt is shown in Figure 6-8.

Plate 6-30 Potential otter holt located along southern boundary of the proposed development site

6.6.5.6 Other species

A pine marten, listed as an EU Habitats directive species, was recorded passing the camera trap location along the Blackhall Little River in the centre of the site. See plate 6-30. No pine marten dens or resting sites were recorded within the development site during the survey.

Plate 6-31. Pine marten recorded passing the camera trap

Map Legend

- EIAR Site Boundary
- Potential Otter holt

N

Drawing Title

Location of potential otter holt

Project Title

Proposed Strategic Employment Zone and Healthcare Application, Moygaddy, Co. Meath

Drawn By	Checked By
CM	IR
Project No.	Drawing No.
210414	Figure 6-8
Scale	Date
1:12,170	2022-08-30

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6.6.6 Importance of Ecological Receptors

Table 6-18 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats that are Key Ecological Receptors. These ecological receptors are considered in Section 6.7 of this report and mitigation/ measures will be incorporated into the proposed development where required, to avoid potential significant impacts on the features.

Table 6-18 Ecological Receptors identified during the assessment

Habitat and Geographic Importance	KER Y/N	Rationale
Habitats		
Local Importance (higher value) habitats: Treeline (WL2) Hedgerow (WL1) Eroding Upland River (FW1)	Yes	These habitats are classified as of *Local Importance (Higher value)* as they help maintain links and act as commuting and foraging corridors for wildlife and are essential in maintaining connectivity to the wider landscape and to features of higher ecological value. **These habitats are considered as KERs.**
Local Importance (Lower value) habitats: Improved Agricultural Grassland (GA1) Spoil and Bare Ground (ED2) Dry Meadows and Grassy Verges (GS2)	No	This habitat is classified as of Local Importance (Lower value) as it has low biodiversity value and is common and widespread in a local, national and international context. This habitat is highly modified, managed habitats with a low biodiversity value. **This habitat is not considered as a KER**
Water Quality		
Watercourses- Rye Water River and Blackhall Little River **(Local importance-higher value)**	*Yes*	The Rye Water River is located at the southern boundary of the site and the Blackhall Little River is located in the centre of the site. Following a precautionary principal, a potential pathway for indirect effects was identified in the form of deterioration of water quality resulting from pollution, associated with the construction and operational phases of the development. The Rye Water River is classified as international importance as it is designated as part of the Rye Water Valley/Carton SAC. **Water quality is considered a KER.**
		Aquatic and Fisheries Species The aquatic species that are associated with the rivers and streams located within and surrounding the site are assigned Local Importance (Higher Value) in that they have a high biodiversity value in the local context. There is potential for indirect effect on these receptors in the form of water pollution. These species include salmonid and coarse fish, lamprey species, white clawed crayfish (*Austropotamobius pallipes*), European eel (*Anguila*

		anguila), Otter (*Lutra lutra*) aquatic invertebrates and other aquatic species.
Fauna		
Bats *Local Importance (Higher value)*	Yes	Based on the information identified within the desk study, and the results of the initial bat survey, bat species have been identified as of Local Importance (Higher Value). The treelines and hedgerow edge habitat within the site may be used by commuting and foraging bats as they provide connectivity with the wider landscape. A pathway for impact was identified in the form of habitat loss and lighting disturbance. **Therefore, bat species are considered as KERs.**
Birds *Local Importance (Lower value)*	Yes	Bird species recorded using the habitats within the site were an assemblage of common birds that are typical of the grassland habitats in the wider area. Hedgerow and treeline habitats within the site may potentially be used by nesting birds. **Bird species are therefore considered as a KER.**
Badger *Local Importance (Higher value)*	Yes	Two badger setts were recorded within **Site C** during the ecological survey. In the absence of mitigation, the proposed development construction works have the potential to cause disturbance/displacement to badger locally. **As such, badgers are considered as a KER.**
Otter *Local Importance (Higher value)*	Yes	A potential otter holt was recorded outside the proposed site boundary. Although no otter holt was recorded within the site boundary, the Rye Water River has the potential to provide good feeding and resting habitat for otter. The construction of an outfall on the Blackhall Little stream and the Rye Water River has the potential to cause disturbance during construction and it is therefore included as a KER and requires further assessment.
Designated Sites		
Rye Water Valley/Carton SAC *International importance*	*Yes*	The River Rye Water flows along southern boundary of the development site. A potential pathway for indirect effects on water dependent Qualifying Interests (QIs) was identified in the form of deterioration of surface water and groundwater quality resulting from pollution, associated with the construction and operational phases of the development. The River Rye water flows into this SAC, Pollution of surface water and groundwater may result in adverse impacts on the following downstream aquatic or groundwater influenced QI habitats within the SAC in the absence of mitigation: **This European Site is therefore included as a KER.**

South Dublin Bay SAC *International importance*	*Yes*	Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Qualifying Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SAC is located approx. 31.8km downstream of the proposed development site. **This European Site is therefore included as a KER.**
North Dublin Bay SAC *International importance*	*Yes*	Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Qualifying Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SAC is located approx. 31.8km downstream of the proposed development site. **This European Site is therefore included as a KER.**
South Dublin Bay and River Tolka Estuary SPA *International importance*	*Yes*	Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Special Conservation Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SPA is located approx. 31.8km downstream of the proposed development site. Potential effects on all SCI species are considered under Wetland and waterbirds [A999]. **This European Site is therefore included as a KER.**
North Bull Island SPA *International importance*	*Yes*	Taking a precautionary approach, a potential pathway for indirect effects on the aquatic Special Conservation Interests of this European Site has been identified in the form of deterioration in water quality due to the release of polluting materials during the construction and operational phases of the development via the Rye Water River and the River Liffey. The SPA is located approx. 31.8km downstream of the proposed development site. Potential effects on all SCI species are considered under Wetland and waterbirds [A999]. **This European Site is therefore included as a KER.**
Rye Water Valley/Carton NHA **Liffey Valley pNHA** *National Importance*	*Yes*	Rye Water Valley/Carton NHA are Liffey Valley pNHA are located downstream of the proposed development with hydrological connectivity via the Rye River and River Liffey. Taking a precautionary approach, this site falls within the likely impact zone of the proposed development. **These national sites are therefore included as KERs**

6.7 Ecological Impact Assessment

The potential ecological impacts of each of the planning application sites is assessed separately below. The individual impacts of the separate planning applications are cumulatively assessed in section 6.7.7.

6.7.1 Site A- Strategic Employment Zone

6.7.1.1 Do Nothing Impact

If the proposed development were not to go ahead, it is likely that the development site would remain as it is in its current agricultural use. The development site may be subject to other development proposals.

6.7.1.2 *Impacts during Construction phase*

Habitat Loss

Habitats Local Importance (Lower Value)

Table 6-19.Habitats of Local Importance (Lower value) recorded in site A

Habitat	Area lost / Length lost
Improved Agricultural Grassland (GA1)	4.8ha

The development footprint will result in the permanent loss of Improved Agricultural Grassland

The effect is assessed a permanent non-significant negative impact on a receptor of *Local Importance Lower Value*. Loss of this habitat to the footprint of the proposal is not considered to be significant at any geographic scale. This habitat is common and widespread in the locality and have a low biodiversity value. The loss of this habitat is considered not significant and therefore no mitigation is required.

Habitats Local Importance (Higher Value)

The habitats of local importance (higher value) that will be lost to the development and the area/length of each habitat lost are listed in Table 6.20.

Table 6-20. Habitat of Local Importance (Higher Value) recorded in site A

Habitat	Area/length lost
Treeline (WL2)	Approx.117m
Hedgerow (WL1)	Approx. 321m

Assessment of the potential effects on the loss of Hedgerow (WL1) and Treeline (WL2) habitat

Table 6-21. Loss of Treeline and Hedgerow habitat associated within site A

Description of Effect	The hedgerow habitat along the eastern boundary along the R157 be removed to facilitate the development. This will result in the removal of 321m of hedgerow habitat. This represents 77% of hedgerow habitat within the development site. The treeline habitat along the L2214 and a small section adjacent to the Blackhall Little Stream will be removed to facilitate the development. This will result in the removal of 117m of treeline habitat. This represents 76% of the treeline habitat within the proposed development site.
Characterisation of unmitigated effect	The loss of 321m of hedgerow would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is Moderate at the local scale given the small area affected. The loss of 177m of treeline would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is Moderate at the local scale given the small area affected.
Assessment of Significance prior to mitigation	This is not significant at a county, national or international scale as it will not affect the conservation status of this habitat, which is widespread and common in the wider area outside the site.
Mitigation	**Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › Hedgerow habitat along the northern boundary will be retained, ensuring ecological connectivity to the wider landscape is maintained. › 157 semi mature trees will be planted within the development site. New treeline habitat will be created along the western and southern boundaries. › An additional 165 whip trees are proposed. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The plan includes for the planting of a new native hedgerow along the eastern boundary of Site A, mainly along the R157. The planting of new native hedgerows will ameliorate any hedgerow loss and to maintain connectivity to the wider area. › Native hedgerow species to be planted include such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › Large sections of grasslands throughout the site will be management as Wildflower meadows and planted with native wildflowers, including Common knapweed (*Centaura nigra*), Ribwort Plantain (Plantago lanceolata), Red clover (Trifolium pratense) and Birds foot trefoil (*Lotus comiculatus*). › The creation of swales will also add new wetland habitat to the landscape, provide new habitat for various invertebrates and amphibians. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application and is available in appendix 4-7. This will ensure that any trees or tree lines that are to be retained within the site are

	fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
Residual Effect following Mitigation	Following the implementation of the mitigation and compensation as described above, there will be no net loss of hedgerow or treeline habitat on the site. The residual impact on hedgerow and treeline will be a short term slight negative effect until the newly planted hedges and trees develop and mature. Ultimately, there will be no residual significant effect on the hedgerow or treeline habitat as a result of the development.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long-term loss of linear landscape features. It therefore cannot contribute to any significant cumulative effect in this regard

Assessment of potential effects on water quality and aquatic faunal species and habitats during construction

Table 6-22. Potential impacts on water during construction associated with site A

Description of Effect	The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. The construction of the surface water outfall pipe within the River Rye Water has the potential to result in the deterioration of water quality. The Rye Water River is located along the southern boundary of Site B. The Rye Water River flows into the River Rye/Carton Valley SAC, located east of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality could occur at a local level as a result of the construction works, should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of site Ahave been fully described in section 8.6.3.2 of Chapter 8 of this EIAR and also described in the CEMP located in volume 3a, appendix 4-3. The mitigation measures are summarised below: The following best practice construction measures will be followed to ensure that there are no significant effects on the Rye Water River as a result of construction works: › Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works,

leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats.

- A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities.
- The silt fence will comprise a geotextile membrane that will buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated.
- As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground;
- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing;
- A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run- off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.
- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;

The following construction measures will be followed to ensure that there are no significant effects on the Rye Water River as a result of the in-stream construction works related to the outfall pipe.

- Prior to the outset of these works, small defined works areas will be fenced off at the location of the storm water outfall (between the main construction site and both water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the Rye Water River
- The necessary pipelaying works will be undertaken within this defined area.
- Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the Rye Water River will be removed to facilitate the construction of the outfall.
- No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Cofferdams will be constructed using one tonne sandbags at the edge of the Rye Water River at the outfall point to create dry working areas.
- A submersible pump will be used to dewater inside the cofferdammed area and will discharge any waters to land at a location of over 30m from the rivers. The pumped waters will discharge through a silt bag.
- The bankside will be excavated and a small pre-cast concrete headwall installed (with outfall pipe included).
- The banks and channel bed will be reinstated to avoid erosion or run off of silt. Following this the dams will be removed.
- The surface water discharge point is likely to take less than one day to install.
- Sondes will be put in place in the Rye Water River upstream and downstream of the works area. These will continuously measure turbidity throughout the construction period. If there is a 10% or greater difference between upstream and downstream turbidity, an alarm will sound and a message will be sent to the site foreman and the ECoW. Works will be ceased until the cause of the difference is identified and (if it is associated with the works) rectified.

As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the River Rye Water.

	Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage: › Biotic and abiotic baseline data will be gathered on the Rye Water River both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Fauna- Disturbance/Habitat loss

Non volant mammals

The construction phase of the proposal has the potential for some localised disturbance to local faunal species. However, no significant faunal species or signs of significant mammal activity were recorded within or immediately adjacent to the proposal during the site visit.

The proposed development site is located in close proximity to the busy roads and existing residential housing developments. Local faunal species are therefore likely to be habituated to anthropogenic activity in the wider area. Impacts on fauna as a result of disturbance during the construction phase are not considered to be significant at any geographic scale.

Best practice measures

- All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crespular or nocturnal species, including bat species.
- Hoarding will be placed around the construction site. This will screen the site and minimise any disturbance impacts on fauna in the wider surroundings.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant machinery will be turned off when not in use.
- Operating machinery will be restricted to the proposed works site area.

Residual Effect

No significant effect

Assessment on the potential impacts on bats during construction

Table 6-23. Assessment of the potential impacts on bats associated with site A

Description of Effect	**Habitat Loss** Trees within the development boundary, which are proposed to be felled, were inspected to determine their suitability for roosting bats. No signs of bats were observed. However, two individual ash trees in the eastern boundary contained ivy cover and/or small cavities and crevices and were considered to be of 'Low to Moderate' suitability for bats given their roosting potential. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species.

	Habitat Fragmentation There will be some loss of linear habitat features to facilitate the proposed development. Approximately 531 metres of hedgerow and 16 trees are proposed for removal. However, significant additional planting is proposed. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species. Potential effects on bats may include: Removal of potential commuting or foraging habitat through the felling of trees.
	Disturbance Construction of the proposed development will result in increased human activity, noise and lighting within the proposed development site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is bordered by existing residential and commercial developments to south, as well as busy local road and adjacent amenity areas. It is likely that bat species in the area are accustomed to some levels of disturbance. In the absence of appropriate design, the development has the potential to disturb bats by illumination of commuting and foraging areas.
Characterisation of unmitigated effect	The construction of the proposed development has the potential to result in a Long-Term Slight Negative effect on the local bat populations in the form of habitat loss, disturbance or direct mortality.
Assessment of Significance prior to mitigation	Significant effects on bats are not anticipated at any geographic scale during the construction of the proposed development.

Mitigation	**Habitat Loss** Following the precautionary principle, a pre-construction survey will be undertaken on the two ash trees in the east of the site with 'Low to Moderate' suitability for bats to be felled, by a qualified ecologist prior to any works, to ensure there are no roosting bats. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the bat survey in July 2021.If bats are found to be roosting in any of the trees, a bat derogation licence must be obtained, and further mitigation prescribed by a licenced ecologist. Tree felling will follow guidelines set out in National Roads Authority, Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. 2006.Tree felling will follow guidelines set out in National Roads Authority, Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. 2006.
	Fragmentation **Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › Hedgerow habitat along the northern boundary will be retained, ensuring ecological connectivity to the wider landscape is maintained. › 157 semi mature trees will be planted within the development site. New treeline habitat will be created along the western and southern boundaries. › An additional 165 whip trees are proposed. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The plan includes for the planting of a new native hedgerow along the eastern boundary of Site A, mainly along the R157. The planting of new native hedgerows will ameliorate any hedgerow loss and to maintain connectivity to the wider area. › Native hedgerow species to be planted include such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › Large sections of grasslands throughout the site will be management as Wildflower meadows and planted with native wildflowers, including Common knapweed (*Centaura nigra*), Ribwort Plantain (Plantago lanceolata), Red clover (Trifolium pratense) and Birds foot trefoil (*Lotus comiculatus*). › The creation of swales will also add new wetland habitat to the landscape, provide new habitat for various invertebrates and amphibians. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application and is available in appendix 4-7. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance

	The majority of works, during the construction phase, will occur during daylight hours. Therefore, there will be no requirement for exterior lighting within the site. Where lighting is unavoidable (i.e. health and safety), low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the proposed development, and consequently on bats i.e. Lighting will be directed away from mature trees/hedgerows/treelines around the periphery of the site boundary to minimize disturbance to bats.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effect in regard to habitat loss for bats. It therefore cannot contribute to any cumulative effect in this regard.

Assessment on the potential impacts on birds during construction

Table 6-24. Potential impacts on birds during the construction phase of site A

Description of Effect	**Habitat Loss/Degradation** The footprint of the proposal will result in the loss of approximately 531 metres of hedgerow and 16 trees individual in Site A are also proposed for removal. This provide good nesting habitat for a range of common bird species.
	Disturbance The loss of 531 metres of hedgerow and 16 trees throughout the site has the potential to result in disturbance to birds and potentially to cause mortality to juvenile birds in the nest
Characterisation of unmitigated effect	**Habitat Loss** In the absence of mitigation, the loss 531 metres of hedgerow and 16 trees has the potential to result in a permanent negative effect in respect of bird nesting habitat. This is considered to be Moderate on this receptor of local importance due to the presence of large areas of suitable habitat in the wider area.
	Disturbance In the absence of mitigation, the loss of 531 metres of hedgerow and 16 trees has the potential to result in a short-term negative effect on nesting bird species. The magnitude of this impact has the potential to be moderate if the works result in mortality of young birds in the nest.
Assessment of Significance	**Habitat Loss** There is no potential for significant effects on this species as a result of habitat loss at any scale.

prior to mitigation	**Disturbance** Whilst there will be no significant effect on birds at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect of disturbance to birds at a local scale during the construction phase of the proposed development prior to mitigation.
Mitigation	**Habitat Loss** **Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › Hedgerow habitat along the northern boundary will be retained, ensuring ecological connectivity to the wider landscape is maintained. › 157 semi mature trees will be planted within the development site. New treeline habitat will be created along the western and southern boundaries. › An additional 165 whip trees are proposed. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The plan includes for the planting of a new native hedgerow along the eastern boundary of Site A, mainly along the R157. The planting of new native hedgerows will ameliorate any hedgerow loss and to maintain connectivity to the wider area. › Native hedgerow species to be planted include such as Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › Large sections of grasslands throughout the site will be management as Wildflower meadows and planted with native wildflowers, including Common knapweed (*Centaura nigra*), Ribwort Plantain (Plantago lanceolata), Red clover (Trifolium pratense) and Birds foot trefoil (*Lotus comiculatus*). › The creation of swales will also add new wetland habitat to the landscape, provide new habitat for various invertebrates and amphibians. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application and is available in appendix 4-7. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance Where possible, all cutting of trees, scrub and tall vegetation will be undertaken outside the bird nesting season which runs from the 1st March to the 31st August. Any cutting of vegetation that may be required outside the season described above will be supervised by a suitably qualified ecologist to ensure that no birds nests are present. Should nesting birds be encountered, the trees will be left until nesting activity has concluded.
Residual Effect following Mitigation	**Habitat Loss** – No significant effect
	Disturbance – No significant effect.

Potential for Cumulative Effect	**Habitat Loss** The proposed development will not result in any significant effect in regard to habitat loss for birds. It therefore cannot contribute to any cumulative effect in this regard.

6.7.1.3 Impacts during operational phase

Disturbance to Fauna

The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.1.2. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

Assessment of potential impacts on bats during the operational phase associated with site A

Table 6-25. Assessment of potential impacts on bats during the operational phase associated with site A

Description of Effect	Construction and operation of the proposed development will result in increased human activity, noise and lighting within the proposed site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is in close proximity to existing residential areas to south as well as busy local roads. It is likely that bat species in the area are accustomed to some levels of disturbance.
Characterisation of unmitigated effect	In the absence of mitigation, the operational phase of the proposed development has the potential to result in Long-Term Slight Negative effect on the local bat populations in the form of disturbance as a result of lighting.
Assessment of Significance prior to mitigation	Whilst there will be no significant effect on bats at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect on bats at a local scale during the operational phase of the proposed development prior to mitigation.
Mitigation	**Mitigation** › The lighting plan for the operational phase of the proposed development, has been designed with consideration of the following guidelines: Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), Dark Sky Ireland, to minimise light spillage, thus reducing any potential disturbance to bats.

	› The proposed lamps have limited backward light properties thus assisting in reducing backward light spill. Lamps have also been specified with 0 Degree tilt (where possible) to ensure limited unwanted light spill. › The lighting plan has been designed to maintain a dark corridor along the hedgerow on the northern boundary of the site. This will ensure commuting and foraging habitat is maintained to habitats west of the site. › All luminaires are fitted with photocells which automatically switch luminaires on during night time and off during daytime. Additionally, all luminaires are to automatically dim by 75% 00:00 – 06:00 (U14 profile). If required and with agreement of the local authority additional dimming is available. › The proposed lighting design uses warmest available LEDs for chosen luminaires (colour temperature set by worst case luminaires, all luminaires same colour temperature for consistency), the peak wave length is 600nm.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted.

Impacts on water quality during the operational phase

The operational phase of the proposed project will result in the production of foul sewage and surface water runoff.

The proposed surface water drainage system incorporates a number of SUDs measures into its design to block potential pathways for impact on water quality, which are fully described in Chapter 4 of this EIAR.

Wastewater from the development will discharge to the proposed onsite wastewater pumping station, which will ultimately link up to the existing Maynooth town wastewater network prior to discharging to Leixlip Wastewater Treatment Plant. The wastewater treatment plant is regulated and operates under an EPA licence which controls emissions to acceptable levels.

Confirmation of Feasibility letters Site A have been received from Irish Water and are included in volume 3b appendix 4-9 of this EIAR.

Mitigation

The risk of uncontrolled emissions is minimized by the collection, treatment and discharge of storm water to the Rye Water River via, attenuation tanks, filter drains and petrol/oil interceptors as described above. It is also proposed to retain the existing riparian zone which will act as a buffer between the development and the Rye Water River..

Wastewater from the Proposed Development will be directed to an EPA regulated wastewater treatment plant via a proposed onsite pumping station

Residual effect

The potential source of pollution can be readily controlled, and standard procedures will ensure no significant releases will occur. Mitigation measures, in particular the attenuation tank, filter drains, and petrol/oil interceptor will break the pathway from the proposed works areas to the watercourse. The residual impacts are indirect, neutral, imperceptible, long term, unlikely impact.

Foul water discharges will be directed to the municipal sewer and regulated wastewater treatment plant and so the residual impacts are neutral, indirect, imperceptible, long term, unlikely impact. Therefore, significant effects on surface water or ground water quality will not occur

6.7.1.4 Impacts on European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Potential Impacts on Rye Water Valley/Carton SAC

Site A drains into the Rye Water River to the south. The Rye Water Valley/Carton SAC is downstream of Site A, to the southeast, directly adjacent to the site boundary on the opposite side of the R157 Regional Road.

The qualifying interests of the SAC is linked to groundwater flows (calcareous tufa springs) There is no connection between groundwater at the development site, and that discharging to any known tufa springs within the SAC (including the mapped spring located approximately 5km from Site A at Louisa Bridge).

Groundwater below Site A will flow to the south and discharge as baseflow to the Rye Water River and/or the Blackhall Little stream to the north. Groundwater flow from the site will, therefore, have no impact on the Louisa Bridge (spring) groundwater flow (Rye Water Valley/Carton SAC) as previous site investigations and hydrological assessments (c.f. Section 2.4, (Hydro-G, 2008)) have shown that the flow to these springs is not derived from the Rye Water River and are in fact fed from a source further east of Louisa Bridge.

Two of the qualifying interests of the SAC are two species of vertigo snail (*Vertigo angustior* and *Vertigo moulinsiana*), with both species' dependant on the calcareous march habitat which is provided by the tufa formation. The known range of both species within the SAC is also restricted to Louisa Bridge (spring). While there are no known petrifying springs or qualifying interests of the Rye Water Valley/Carton SAC within proximity of Site A i.e. Louisa Bridge. An ecological walkover survey of the SAC by MKO to identify any additional tufa springs or potential habitat for vertigo snails downstream of the Proposed Development site has not identified petrifying springs nor their associated qualifying interests in this area of the SAC. Irrespective of this the potential for the occurrence of unmapped petrifying springs within the SAC has also been considered below.

Although there is no potential for effects on the known QI of the SAC the following mitigation will ensure no impact on the SAC generally. Standard mitigation and SuDS drainage controls are proposed during the construction and operational phase of Site A (e.g., silt traps/road gullies, hydrocarbon interceptors, attenuation storage and infiltration, and hydro-brake flow limiters) which have been proven through widespread use in housing and commercial developments across the country. The proposed SuDs drainage system incorporated into the engineering design of the site are common drainage systems that are used in development sites. They are proposed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005) and the objectives outlined in the Meath County Development Plan 2021-2027.

These standard drainage design controls and construction phase mitigation measures will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the proposed development.

The project design ensures that there will be no dewatering of the bedrock aquifer during the construction phase and so there will be no obstruction or alteration of existing groundwater flows.

There will be no significant alteration to groundwater recharge. The majority of rainfall will continue to percolate to shallow subsurface and discharge to the surface water systems locally with low levels of recharge to ground, in particular for Site A with is underlain with low permeability subsoils. During the construction phase, the recharge rates won't change materially.

With the implementation of the project as designed and the standard drainage control measures outlined above the potential for Site A to cause any groundwater drawdown or groundwater quality impacts in the SAC is imperceptible.

Groundwater flowpaths will be maintained during the construction phase as any excavation proposed will be shallow. The SI data shows that dewatering of groundwater from the bedrock aquifer will not occur and so there is no potential for significant effects on the calcareous tufa springs and associated species.

Following an extremely precautionary principle, the potential for other downstream designated sites (South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA) to be impacted by the proposed works was also considered. On the basis of the Proposed Development design and the mitigation measures proposed to protect the immediate water receptors there will be no impacts on designated sites.

Pathway: Site drainage network and groundwater flowpaths.

Receptor: Rye Water Valley/Carton SAC and any associated Tufa Springs and vertigo snail populations (including the known spring 5km downstream at Louisa Bridge).

Pre-Mitigation Impact

Indirect, negative, slight, short term, likely impact to water quality and hydrology regime.

Proposed Mitigation Measures

The proposed mitigation measures for protection of surface water and groundwater quality which will include on site drainage control measures (i.e., silt fences, silt bags etc.) will ensure that the quality of runoff from Proposed Development areas will be good. All mitigation measures outlined throughout Section 8.6.3 above provides controls which will be put in place to manage risks associated with sediment, hydrocarbons/chemicals and cement-based products used during construction phase.

The standard drainage design controls will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the Proposed Development.

Residual Impact

With the application of the best practice mitigation outlined above, the residual effect will be – Imperceptible, direct, negative, short-term, high probability impact on surface and ground water receptors.

Significance of Effects

For the reasons outlined above, no significant effects will occur on any designated site.

The NIS report concludes that:

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation of the proposed development does not adversely affect the integrity of European sites.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site."

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Those nationally designated sites that were also designated as SACs/SPAs were considered and the potential for significant or adverse effects to occur were discounted on the same basis as described above in relation to the corresponding European Sites. Where there are pathways for effect on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

The proposed development site is located directly adjacent to the Rye Water Valley/Carton NHA, which is also designated as Rye Water Valley/Carton SAC.

Liffey Valley pNHA located downstream of the proposed development with hydrological connectivity via the Rye Water River and River Liffey.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapter 4 and section 8.6 of Chapter 8 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Chapter 4 and section 8.6 of Chapter 8 of this EIAR.

6.7.2 Site B- Healthcare Facilities

6.7.2.1 Do Nothing Impact

If the proposed development were not to go ahead, it is likely that the development site would remain as it is in its current agricultural use. The development site may be subject to other development proposals.

6.7.2.2 *Impacts during Construction phase*

Habitat Loss

Habitats Local Importance (Lower Value)

Table 6-26.Habitats of Local Importance (Lower value)

Habitat	Area lost / Length lost
Improved Agricultural Grassland (GA1)	Approx. 2.5ha

The development footprint will result in the permanent loss of Improved Agricultural Grassland

The effect is assessed a permanent non-significant negative impact on a receptor of *Local Importance Lower Value*. Loss of this habitat to the footprint of the proposal is not considered to be significant at any geographic scale. This habitat is common and widespread in the locality and have a low biodiversity value. The loss of this habitat is considered not significant and therefore no mitigation is required.

Habitats Local Importance (Higher Value)

The habitats of local importance (higher value) that will be lost to the development and the area/length of each habitat lost are listed in Table 6.27.

Table 6-27. Habitat of Local Importance (Higher Value)

Habitat	Area/length lost
Hedgerow (WL1) (including 4 trees)	263m

Assessment of the potential effects on the loss of Hedgerow (WL1) and Treeline (WL2) habitat

Table 6-28. Loss of Treeline and Hedgerow habitat associated with site B

Description of Effect	Approximately 263m of hedgerow will be lost to facilitates new entrances along the eastern boundary of the site. This represents 33% of the total hedgerow habitat. The landscaping plan has been designed to retain the majority of the trees located within the development site. A total of 27 trees were identified within the development site and only 4 trees located to the east of the site proposed for removal. This represents 14% of the total trees within the site. The landscaping plan has also been designed to retain the mature treeline along the southern boundary of the site and hedgerow habitat at the northern boundary.
Characterisation of unmitigated effect	The loss of 263m of hedgerow and 4 trees would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is Moderate at the local scale given the small area affected.
Assessment of Significance prior to mitigation	This is not significant at a county, national or international scale as it will not affect the conservation status of this habitat, which is widespread and common in the wider area outside the site.
Mitigation	The landscaping plan has also been designed to retain the mature treeline along the southern boundary of the site and hedgerow habitat at the northern boundary. **Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › 100 new trees will be planted within the application site. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity. › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The plan includes for the additional planting of new native hedgerow throughout the site. This will be located along the eastern boundary where the existing hedgerow will be removed. Additional hedgerow s will also be planting throughout the centre of the development. The planting of new native hedgerows will greatly increase the hedgerow habitat coverage within the area and increase ecological connectivity to the wider landscape. › Native hedgerows will be planting with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › Native hedgerows will be maintained and managed for wildlife, this includes allowing hedgerows to grow wide and dense at the base, with a wide, uncultivated grassy margin. Hedgerows should be allowed to mature before the first cut and future cutting should happen on a 3/5-year rotation. Hedgerows should be kept as dark spaces to allow commuting and foraging habitat for local wildlife. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.

Residual Effect following Mitigation	Following the implementation of the mitigation and compensation as described above, there will be no net loss of hedgerow or treeline habitat on the site. The residual impact on hedgerow will be a short term slight negative effect until the newly planted hedges develop and mature. Ultimately, there will be no residual significant effect on the hedgerow habitat as a result of the development.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long-term loss of linear landscape features. It therefore cannot contribute to any significant cumulative effect in this regard.

Assessment of potential effects on water quality and aquatic faunal species and habitats during construction

Table 6-29. Potential impacts on water during construction

Description of Effect	The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. The construction of the surface water outfall pipe within the River Rye Water has the potential to result in the deterioration of water quality. The Rye Water River is located along the southern boundary of the site. The Rye Water River flows into the River Rye/Carton Valley SAC, located east of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality are anticipated could occur at a local level as a result of the construction works, prior to should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of the main development areas have been outlined in section 8.6.3.5 of Chapter 8 of this EIAR and are fully described in the CEMP located in Volume 3.b, Appendix 4-3. The mitigation measures are summarised below. The following best practice construction measures will be followed to ensure that there are no significant effects on the Rye Water River as a result of construction works: › Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats.

- A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities.
- The silt fence will comprise a geotextile membrane that will buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated.
- As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground;
- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing;
- A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run- off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.
- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;

The following construction measures will be followed to ensure that there are no significant effects on the Rye Water River as a result of the in-stream construction works related to the outfall pipe.

- Prior to the outset of these works, small defined works areas will be fenced off at the location of the storm water outfall (between the main construction site and both water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the Rye Water River
- The necessary pipelaying works will be undertaken within this defined area.
- Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the Rye Water River will be removed to facilitate the construction of the outfall.
- No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Cofferdams will be constructed using one tonne sandbags at the edge of the Rye Water River at the outfall point to create dry working areas.
- A submersible pump will be used to dewater inside the cofferdammed area and will discharge any waters to land at a location of over 30m from the rivers. The pumped waters will discharge through a silt bag.
- The bankside will be excavated and a small pre-cast concrete headwall installed (with outfall pipe included).
- The banks and channel bed will be reinstated to avoid erosion or run off of silt. Following this the dams will be removed.
- The surface water discharge point is likely to take less than one day to install.

Sondes will be put in place in the Rye Water River upstream and downstream of the works area. These will continuously measure turbidity throughout the construction period. If there is a 10% or greater difference between upstream and downstream turbidity, an alarm will sound and a message will be sent to the site foreman and the ECoW. Works will be ceased until the cause of the difference is identified and (if it is associated with the works) rectified.

As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the River Rye Water.

	Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage: Biotic and abiotic baseline data will be gathered on the Rye Water River both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Fauna- Disturbance/Habitat loss

Non volant mammals

The construction phase of the proposal has the potential for some localised disturbance to local faunal species. However, no significant faunal species or signs of significant mammal activity were recorded within or immediately adjacent to the proposal during the site visit.

The proposed development site is located in close proximity to the busy roads and existing residential housing developments. Local faunal species are therefore likely to be habituated to anthropogenic activity in the wider area. Impacts on fauna as a result of disturbance during the construction phase are not considered to be significant at any geographic scale.

Best practice measures

- All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crespular or nocturnal species, including bat species.
- Hoarding will be placed around the construction site. This will screen the site and minimise any disturbance impacts on fauna in the wider surroundings.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant machinery will be turned off when not in use.
- Operating machinery will be restricted to the proposed works site area.

Residual Effect

No significant effect

Assessment on the potential impacts on bats during construction

Table 6-30. Assessment of the potential impacts on bats associated with site B

Description of Effect	**Habitat Loss** Trees within the development boundary, which are proposed to be felled, were inspected to determine their suitability for roosting bats. No signs of bats were observed. However, two individual ash trees in the western boundary contained ivy cover and/or small cavities and crevices and were considered to be of 'Low to Moderate' suitability for bats given their roosting potential.

	Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species.
	Habitat Fragmentation There will be some loss of linear habitat features to facilitate the proposed development. Approximately 263m of hedgerow are proposed for removal. However, significant additional planting is proposed. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species. Potential effects on bats may include: Removal of potential commuting or foraging habitat through the felling of trees.
	Disturbance Construction of the proposed development will result in increased human activity, noise and lighting within the proposed development site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is bordered by existing residential and commercial developments to south, as well as busy local road and adjacent amenity areas. It is likely that bat species in the area are accustomed to some levels of disturbance. In the absence of appropriate design, the development has the potential to disturb bats by illumination of commuting and foraging areas.
Characterisation of unmitigated effect	The construction of the proposed development has the potential to result in a Long-Term Slight Negative effect on the local bat populations in the form of habitat loss, disturbance or direct mortality.
Assessment of Significance prior to mitigation	Significant effects on bats are not anticipated at any geographic scale during the construction of the proposed development.
Mitigation	**Habitat Loss** Following the precautionary principle, a pre-construction survey will be undertaken on the two ash trees in the east of the site with 'Low to Moderate' suitability for bats to be felled, by a qualified ecologist prior to any works, to ensure there are no roosting bats. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the bat survey in July 2021. If bats are found to be roosting in any of the trees, a bat derogation licence must be obtained, and further mitigation prescribed by a licenced ecologist. Tree felling will follow guidelines set out in National Roads Authority, Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. 2006. Tree felling will follow guidelines set out in National Roads Authority, *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.* 2006.

	Fragmentation **Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › 100 new trees will be planted within the application site. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity. › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The plan includes for the additional planting of new native hedgerow throughout the site. This will be located along the eastern boundary where the existing hedgerow will be removed. Additional hedgerow s will also be planting throughout the centre of the development. The planting of new native hedgerows will greatly increase the hedgerow habitat coverage within the area and increase ecological connectivity to the wider landscape. › Native hedgerows will be planting with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › Native hedgerows will be maintained and managed for wildlife, this includes allowing hedgerows to grow wide and dense at the base, with a wide, uncultivated grassy margin. Hedgerows should be allowed to mature before the first cut and future cutting should happen on a 3/5-year rotation. Hedgerows should be kept as dark spaces to allow commuting and foraging habitat for local wildlife. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. A tree protection plan is included in this application. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance The majority of works, during the construction phase, will occur during daylight hours. Therefore, there will be no requirement for exterior lighting within the site. Where lighting is unavoidable (i.e. health and safety), low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the proposed development, and consequently on bats i.e. Lighting will be directed away from mature trees/hedgerows/treelines around the periphery of the site boundary to minimize disturbance to bats.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effect in regard to habitat loss for bats. It therefore cannot contribute to any cumulative effect in this regard.

Assessment on the potential impacts on birds during construction

Table 6-31. Potential impacts on birds during the construction phase of site B

Description of Effect	**Habitat Loss/Degradation** The footprint of the proposal will result in the loss of approximately 263m of hedgerow. 4 individual trees in Site A are also proposed for removal. This provides good nesting habitat for a range of common bird species.
	Disturbance The loss of the hedgerow habitat and 4 trees throughout the site has the potential to result in disturbance to birds and potentially to cause mortality to juvenile birds in the nest
Characterisation of unmitigated effect	**Habitat Loss** In the absence of mitigation, the loss of 263m of hedgerow and 4 trees has the potential to result in a permanent negative effect in respect of bird nesting habitat. This is considered to be a slight effect on this receptor of local importance due to the presence of large areas of suitable habitat in the wider area.
	Disturbance In the absence of mitigation, the loss of linear features and 4 trees has the potential to result in a short-term negative effect on nesting bird species. The magnitude of this impact has the potential to be moderate if the works result in mortality of young birds in the nest.
Assessment of Significance prior to mitigation	**Habitat Loss** There is no potential for significant effects on this species as a result of habitat loss at any scale.
	Disturbance Whilst there will be no significant effect on birds at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect of disturbance to birds at a local scale during the construction phase of the proposed development prior to mitigation.
Mitigation	**Habitat Loss** › 100 new trees will be planted within the application site. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity. › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The plan includes for the additional planting of new native hedgerow throughout the site. This will be located along the eastern boundary where the existing hedgerow will be removed. Additional hedgerow s will also be planting throughout the centre of the development. The planting of new native hedgerows will greatly increase the hedgerow habitat coverage within the area and increase ecological connectivity to the wider landscape. › Native hedgerows will be planting with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › Native hedgerows will be maintained and managed for wildlife, this includes allowing hedgerows to grow wide and dense at the base, with a wide, uncultivated grassy margin. Hedgerows should be allowed to mature before the first cut and future cutting should happen on a 3/5-year rotation. Hedgerows should be kept as dark spaces to allow commuting and foraging habitat for local wildlife.

	› The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. A tree protection plan is included in this application. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance Where possible, all cutting of trees, scrub and tall vegetation will be undertaken outside the bird nesting season which runs from the 1st March to the 31st August. Any cutting of vegetation that may be required outside the season described above will be supervised by a suitably qualified ecologist to ensure that no birds nests are present. Should nesting birds be encountered, the trees will be left until nesting activity has concluded.
Residual Effect following Mitigation	**Habitat Loss** – No significant effect
	Disturbance – No significant effect.
Potential for Cumulative Effect	**Habitat Loss** The proposed development will not result in any significant effect in regard to habitat loss for birds. It therefore cannot contribute to any cumulative effect in this regard.

6.7.2.3 Impacts during operational phase

Disturbance to Fauna

The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.2.2. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

Assessment on the potential impacts on bats during the operational phase Bats

Table 6-32. Assessment of potential impacts on bats during the operational phase of site B

Description of Effect	Construction and operation of the proposed development will result in increased human activity, noise and lighting within the proposed site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is in close proximity to existing residential areas to south as well as busy local roads. It is likely that bat species in the area are accustomed to some levels of disturbance.
Characterisation of unmitigated effect	In the absence of mitigation, the operational phase of the proposed development has the potential to result in Long-Term Slight Negative effect on the local bat populations in the form of disturbance as a result of lighting.
Assessment of Significance prior to mitigation	Whilst there will be no significant effect on bats at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect on bats at a local scale during the operational phase of the proposed development prior to mitigation.
Mitigation	A lighting plan has been prepared as part of this application. › The lighting plan for the operational phase of the proposed development, has been designed with consideration of the following guidelines: Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), Dark Sky Ireland, to minimise light spillage, thus reducing any potential disturbance to bats. › Bat surveys carried out in 2021 indicate the Treeline along the southern boundary of the site is the most important commuting habitat for bats. This linear feature will remain in darkness and not have any artificial lighting. › The lighting plan has been designed to maintain a dark corridor along the hedgerow on the northern boundary of the site. This will ensure commuting and foraging habitat is maintained to habitats west of the site. › The proposed lamps have limited backward light properties thus assisting in reducing backward light spill. Lamps have also been specified with 0 Degree tilt (where possible) to ensure limited unwanted light spill.

	› The lighting plan has been designed to maintain a dark corridor along the hedgerow on the northern boundary of the site. This will ensure commuting and foraging habitat is maintained to habitats west of the site. › All luminaires are fitted with photocells which automatically switch luminaires on during night time and off during daytime. Additionally, all luminaires are to automatically dim by 75% 00:00 – 06:00 (U14 profile). If required and with agreement of the local authority additional dimming is available. › The proposed lighting design uses warmest available LEDs for chosen luminaires (colour temperature set by worst case luminaires, all luminaires same colour temperature for consistency), the peak wave length is 600nm.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted.

Impacts on water quality during operation

The operational phase of the proposed project will result in the production of foul sewage and surface water runoff.

The proposed surface water drainage system incorporates a number of SUDs measures into its design to block potential pathways for impact on water quality, which are fully described in Chapter 4 of this EIAR.

Wastewater from the development will discharge to the proposed onsite wastewater pumping station, which will ultimately link up to the existing Maynooth town wastewater network prior to discharging to Leixlip Wastewater Treatment Plant. The wastewater treatment plant is regulated and operates under an EPA licence which controls emissions to acceptable levels.

Confirmation of Feasibility letters for Site B have been received from Irish Water and are included in volume 3b appendix 4-9 of this EIAR.

Mitigation

The risk of uncontrolled emissions is minimized by the collection, treatment and discharge of storm water to the Rye Water River via, attenuation tanks, filter drains and petrol/oil interceptors as described above. It is also proposed to retain the existing riparian zone which will act as a buffer between the development and the Rye Water.

Wastewater from the Proposed Development will be directed to an EPA regulated wastewater treatment plant via a proposed onsite pumping station

Residual effect

The potential source of pollution can be readily controlled, and standard procedures will ensure no significant releases will occur. Mitigation measures, in particular the attenuation tank, filter drains, and petrol/oil interceptor will break the pathway from the proposed works areas to the watercourse. The residual impacts are indirect, neutral, imperceptible, long term, unlikely impact.

Foul water discharges will be directed to the municipal sewer and regulated wastewater treatment plant and so the residual impacts are neutral, indirect, imperceptible, long term, unlikely impact. Therefore, significant effects on surface water or ground water quality will not occur

6.7.2.4 Impacts on European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Potential Impacts on Rye Water Valley/Carton SAC

Site B drains into the Rye Water River to the south. The Rye Water Valley/Carton SAC is downstream of Site B, to the east, directly adjacent to the site boundary on the opposite side of the R157 Regional Road.

The qualifying interests of the SAC is linked to groundwater flows (calcareous tufa springs) There is no connection between groundwater at the development site, and that discharging to any known tufa springs within the SAC (including the mapped spring located approximately 5km from Site B at Louisa Bridge).

Groundwater below Site B will flow to the south and discharge as baseflow to the Rye Water River and/or the Blackhall Little stream to the west. Groundwater flow from the site will, therefore, have no impact on the Louisa Bridge (spring) groundwater flow (Rye Water Valley/Carton SAC) as previous site investigations and hydrological assessments (c.f. Section 2.4, (Hydro-G, 2008)) have shown that the flow to these springs is not derived from the Rye Water River and are in fact fed from a source further east of Louisa Bridge.

Two of the qualifying interests of the SAC are two species of vertigo snail (Vertigo angustior and Vertigo moulinsiana), with both species' dependant on the calcareous march habitat which is provided by the tufa formation. The known range of both species within the SAC is also restricted to Louisa Bridge (spring). While there are no known petrifying springs or qualifying interests of the Rye Water Valley/Carton SAC within proximity of Site A i.e. Louisa Bridge. An ecological walkover survey of the SAC by MKO to identify any additional tufa springs or potential habitat for vertigo snails downstream of the Proposed Development site has not identified petrifying springs nor their associated qualifying interests in this area of the SAC. Irrespective of this the potential for the occurrence of unmapped petrifying springs within the SAC has also been considered below.

Although there is no potential for effects on the known QI of the SAC the following mitigation will ensure no impact on the SAC generally. Standard mitigation and SuDS drainage controls are proposed during the construction and operational phase of Site B (e.g., silt traps/road gullies, hydrocarbon interceptors, attenuation storage and infiltration, and hydro-brake flow limiters) which have been proven through widespread use in housing and commercial developments across the country. The proposed SuDs drainage system incorporated into the engineering design of the site are common drainage systems that are used in development sites. They are proposed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005) and the objectives outlined in the Meath County Development Plan 2021-2027.

These standard drainage design controls and construction phase mitigation measures will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the proposed development.

The project design ensures that there will be no dewatering of the bedrock aquifer during the construction phase and so there will be no obstruction or alteration of existing groundwater flows.

There will be no significant alteration to groundwater recharge. The majority of rainfall will continue to percolate to shallow subsurface and discharge to the surface water systems locally with low levels of recharge to ground, in particular for Site B with is underlain with low permeability subsoils. During the construction phase, the recharge rates won't change materially.

With the implementation of the project as designed and the standard drainage control measures outlined above the potential for Site B to cause any groundwater drawdown or groundwater quality impacts in the SAC is imperceptible.

Groundwater flowpaths will be maintained during the construction phase as any excavation proposed will be shallow. The SI data shows that dewatering of groundwater from the bedrock aquifer will not occur and so there is no potential for significant effects on the calcareous tufa springs and associated species.

Following an extremely precautionary principle, the potential for other downstream designated sites (South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA) to be impacted by the proposed works was also considered. On the basis of the Proposed Development design and the mitigation measures proposed to protect the immediate water receptors there will be no impacts on designated sites.

Pathway: Site drainage network and groundwater flowpaths.

Receptor: Rye Water Valley/Carton SAC and any associated Tufa Springs and vertigo snail populations (including the known spring 5km downstream at Louisa Bridge).

Pre-Mitigation Impact

Indirect, negative, slight, short term, likely impact to water quality and hydrology regime.

Proposed Mitigation Measures

The proposed mitigation measures for protection of surface water and groundwater quality which will include on site drainage control measures (i.e., silt fences, silt bags etc.) will ensure that the quality of runoff from Proposed Development areas will be good. All mitigation measures outlined throughout Section 8.6.3 of Chapter 8 provides controls which will be put in place to manage risks associated with sediment, hydrocarbons/chemicals and cement-based products used during construction phase.

The standard drainage design controls will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the Proposed Development.

Residual Impact

With the application of the best practice mitigation outlined above, the residual effect will be – Imperceptible, direct, negative, short-term, high probability impact on surface and ground water receptors.

Significance of Effects

For the reasons outlined above, no significant effects will occur on any designated site.

The NIS report concludes that:

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation of the proposed development does not adversely affect the integrity of European sites.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site."

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Those nationally designated sites that were also designated as SACs/SPAs were considered and the potential for significant or adverse effects to occur were discounted on the same basis as described above in relation to the corresponding European Sites. Where there are pathways for effect on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

The proposed development site is located directly adjacent to the Rye Water Valley/Carton NHA, which is also designated as Rye Water Valley/Carton SAC.

Liffey Valley pNHA located downstream of the proposed development with hydrological connectivity via the Rye Water River and River Liffey.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapter 4 and section 8.6 of Chapter 8 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Chapter 4 and section 8.6 of Chapter 8 of this EIAR.

6.7.3 Site C – Strategic Housing Development

6.7.3.1 Do Nothing Impact

If the proposed development were not to go ahead, it is likely that the development site would remain as it is in its current agricultural use. The development site may be subject to other development proposals.

6.7.3.2 *Impacts during Construction phase*

Habitat Loss

Habitats Local Importance (Lower Value)

Table 6-33.Habitats of Local Importance (Lower value)

Habitat	Area lost / Length lost
Improved Agricultural Grassland (GA1)	7.4ha

The development footprint will result in the permanent loss of Improved Agricultural Grassland

The effect is assessed a permanent non-significant negative impact on a receptor of *Local Importance Lower Value*. Loss of this habitat to the footprint of the proposal is not considered to be significant at any geographic scale. This habitat is common and widespread in the locality and have a low biodiversity value. The loss of this habitat is considered not significant and therefore no mitigation is required.

Habitats Local Importance (Higher Value)

Table 6-34.Habitats of Local Importance (Higher Value)

Habitat	Area/length lost
Hedgerow (WL1) (including 29 trees)	Approx. 1,022m
Mixed Broadleaved Woodland (WD4)	0.09ha

Assessment of the potential effects on the loss of Treeline (WL2) and Hedgerow (WL1) habitat

Table 6-35. Loss of Treeline and Hedgerow habitat associated with Site C

Description of Effect	1,022m of hedgerow in the centre of the site and along the northern boundary will be lost as it is within the footprint of the development. This represents 53% of hedgerow habitat within the development site. 29 trees located within the hedgerow habitat will be felled to facilitate the development, most occurring along the northern boundary adjacent to the L2214. The loss of 29 trees represents 22% of the total trees identified on site. The landscaping plan has been designed to avoid the mature Tree Line habitat that has been identified along the southern boundary of the site and the mature Trees surrounding Moygaddy Castle.
Characterisation of unmitigated effect	The loss of 1,022m of hedgerow would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is Moderate at the local scale given the small area affected. The loss of 29 trees would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is Moderate at the local scale given the small area affected.

Assessment of Significance prior to mitigation	This is not significant at a county, national or international scale as it will not affect the conservation status of this habitat, which is widespread and common in the wider area outside the site.
Mitigation	The development has been designed to retain approximately 590m of mature treeline habitat along the southern boundary of the project area and hedgerow habitat along the eastern boundary, maintaining connectivity to wider environment. Approx. 888m of hedgerow will be retained within the site. **Mitigation** A landscaping plan has been prepared for the proposed development and is available in **Appendix 4-7.** › The tree survey report accompanying this application outlined the removal of 29 trees at the site, many of which have been highlighted for removal due to poor condition. A total of 125 trees will be retained at the site. › In addition to this, 591 new trees will be planted within the site. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity › The plan includes for the planting of a new native treeline along the southern boundary of the site. To ameliorate any tree loss and to maintain connectivity to the wider area. › Approximately 364m^2 of native hedgerow is proposed for planting along the northern and western boundaries. This will ensure habitat connectivity is maintained to the wider landscape. › Native tree species to be used for planting include Alder (*Alnus glutinosa*), Pedunculate oak (*Quercus robur),* Scots Pine (Pinus sylvestris), Silver Birch (*pendula*) and Rowan (Sorbus aucuparia). › Native hedgerows will be planting with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › In addition to native hedgerow and tree planting, approximately 11,492m^2 of shrub planting is proposed throughout the development site. Pollinator friendly species such as *Lavandula angustifolia* and *Hypericum Hidcote* will provide a large increase in food source availability in the proposed shrub planting areas. › Large sections of grasslands throughout the site will be management as Wildflower meadows and planted with native wildflowers, including Common knapweed (*Centaura nigra*), Ribwort Plantain (*Plantago lanceolata*), Red clover (*Trifolium pratense*) and Birds foot trefoil (*Lotus comiculatus*). › The creation of swales will also add new wetland habitat to the landscape, provide new habitat for various invertebrates and amphibians. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
Residual Effect following Mitigation	Following the implementation of the mitigation and compensation as described above, there will be no net loss of hedgerow or treeline habitat on the site. The residual impact on hedgerow will be a short term slight negative effect until the newly planted hedges develop and mature. Ultimately, there will be no residual significant effect on the hedgerow habitat as a result of the development.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long-term loss of linear landscape features. It therefore cannot contribute to any significant cumulative effect in this regard

Assessment of the potential effects on the loss of Mixed Broadleaved Woodland (WD4)

Table 6-36. Loss of Mixed broadleaved woodland (WD4) associated with Site C

Description of Effect	The proposed development has been designed to retain the vast majority of the mixed broadleaved woodland habitat. However, it is proposed approximately 0.09ha of mixed broadleaved woodland habitat will be lost to facilitate pedestrian and cycle pathways. This accounts for only 4.5% of the total area of woodland. 95.5% of woodland habitat will be retained.
Characterisation of unmitigated effect	In the absence of mitigation, the loss of 0.09ha of mixed mixed broadleaved woodland constitutes a slight permanent negative effect on the habitat within the site. Whilst this habitat does not correspond to any Annex I Habitat, it adds considerable biodiversity value to the site. It also contributes to the ecological and habitat connectivity throughout the site and within the wider area. However, given the very small area of woodland edge to be lost and the presence of similar habitat in the wider area, the loss of mixed broadleaved woodland is considered to be a permanent slight negative impact at the local scale.
Assessment of Significance prior to mitigation	The loss of 0.09 ha of this habitat is not significant at any geographic scale
Mitigation	The development has been designed to retain the vast majority of the woodland within the site boundary, with only a very small section (4.5%) of the woodland being lost to the development. Whilst no significant loss of woodland will occur, a landscaping plan has been prepared for the proposed development which provides for the replanting of native woodland habitat within the development site to ameliorate any tree loss and to maintain connectivity with the wider. **Mitigation** › The tree survey report accompanying this application outlined the removal of 29 trees at the site, many of which have been highlighted for removal due to poor condition. A total of 125 trees will be retained at the site. › In addition to this, 591 new trees will be planted within the site. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity › The plan includes for the planting of a new native treeline along the southern boundary of the site. To ameliorate any tree loss and to maintain connectivity to the wider area. › Approximately 364m^2 of native hedgerow is proposed for planting along the northern and western boundaries. This will ensure habitat connectivity is maintained to the wider landscape. › Native tree species to be used for planting include Alder (*Alnus glutinosa*), Pedunculate oak (*Quercus robur),* Scots Pine (Pinus sylvestris), Silver Birch (*pendula*) and Rowan (Sorbus aucuparia). › Native hedgerows will be planting with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › In addition to native hedgerow and tree planting, approximately 11,492m^2 of shrub planting is proposed throughout the development site. Pollinator friendly species such as *Lavandula angustifolia* and *Hypericum Hidcote* will provide a large increase in food source availability in the proposed shrub planting areas. › Large sections of grasslands throughout the site will be management as Wildflower meadows and planted with native wildflowers, including Common knapweed (*Centaura nigra*), Ribwort Plantain (*Plantago lanceolata*), Red clover (*Trifolium pratense*) and Birds foot trefoil (*Lotus comiculatus*). › The creation of swales will also add new wetland habitat to the landscape, provide new habitat for various invertebrates and amphibians.

	› The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. A tree protection plan is included in this application This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
Residual Effect following Mitigation	Following the implementation of the mitigation as described above no signfiicant residual effects are anticipated.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long-term loss of woodland habitat. It therefore cannot contribute to any significant cumulative effect in this regard

Assessment of the potential impacts on water quality and aquatic faunal species and habitats during construction

Table 6-37. Impacts on water quality associated with Site C

Description of Effect	The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. The construction of the outfall pipes within the River Rye Water and the Blackhall Little River has the potential to result in the deterioration of water quality. The construction of two pedestrian and cycle bridges along the Blackhall Little River also have the potential to result in the deterioration of water quality. The Blackhall Little River flows through the eastern section of the site in a southerly direction and connects to the Rye Water River, located along the southern boundary of the development site. The Rye Water River flows into the River Rye/Carton Valley SAC, approximately 0.68km downstream of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) white-clawed crayfish,, salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality could occur at a local level as a result of the construction works, should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of the main development areas have been outlined in section 8.6.3.6 of Chapter 8 of this EIAR and are fully described in the CEMP located in Volume 3.c, Appendix 4-3. The mitigation measures are summarised below.

The following best practice construction measures will be followed to ensure that there are no significant effects on the Rye Water River or the Blackhall Little as a result of construction works:

- Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats.
- A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities.
- The silt fence will comprise a geotextile membrane that will buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated.
- As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground;
- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing;
- A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run- off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.
- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;

The following best practice construction measures will be followed to ensure that there are no significant effects on the Rye Water River or the Blackhall Little River as a result of the in-stream construction works related to the outfall pipes.

- Prior to the outset of these works, small defined works areas will be fenced off at the location of the storm water outfall (between the main construction site and both water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the Rye Water River
- The necessary pipelaying works will be undertaken within this defined area.
- Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the Rye Water River will be removed to facilitate the construction of the outfall.
- No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Cofferdams will be constructed using one tonne sandbags at the edge of the Rye Water River at the outfall point to create dry working areas.
- A submersible pump will be used to dewater inside the cofferdammed area and will discharge any waters to land at a location of over 30m from the rivers. The pumped waters will discharge through a silt bag.
- The bankside will be excavated and a small pre-cast concrete headwall installed (with outfall pipe included).
- The banks and channel bed will be reinstated to avoid erosion or run off of silt. Following this the dams will be removed.
- The surface water discharge point is likely to take less than one day to install.

Sondes will be put in place in the Rye Water River upstream and downstream of the works area. These will continuously measure turbidity throughout the construction period. If there is a 10% or greater difference between upstream and downstream turbidity, an alarm will sound and a message will be sent to the site foreman and the EcoW. Works will be ceased until the cause of the difference is identified and (if it is associated with the works) rectified

Aquatic species-White Clawed Crayfish

The following section described the mitigation measures that will ensure there is no significant effect on white clawed crayfish as a result of the in-stream construction works proposed.
Prior to any construction works carried out within the Rye Water River or Blackhall Little River, a pre-commencement white clawed crayfish survey will be undertaken to ensure no crayfish occur within the works areas.
The survey will be carried out by a qualified professional under licence from the National Parks and Wildlife Services (NPWS)
All works within this area will be subject to strict biosecurity protocols to prevent the spread of the crayfish plague which is caused by the fungal-like organism, *Aphanomyces astaci.*

The following best practice construction measures will be followed to ensure that there are no significant effects on the Blackhall Little River as a result of the construction of the two pedestrian and cycle bridges:

- The proposed design for water course crossings and culverts, which minimises interactions with water courses, ensures that there will be no perceptible effects on the morphology of those watercourses.
- Prior to the outset of these works, small defined works areas will be fenced off at the location of the storm water outfall (between the main construction site and both water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the Blackhall Little Stream
- The necessary pipelaying works will be undertaken within this defined area.
- Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the Blackhall Little Stream will be removed to facilitate the construction of the outfall.
- No instream works will take place outside the period July 31st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Cofferdams will be constructed using one tonne sandbags at the edge of the Blackhall Little Stream at the outfall point to create dry working areas.
- A submersible pump will be used to dewater inside the cofferdammed area and will discharge any waters to land at a location of over 30m from the rivers. The pumped waters will discharge through a silt bag.
- The bankside will be excavated and a small pre-cast concrete headwall installed (with outfall pipe included).
- The banks and channel bed will be reinstated to avoid erosion or run off of silt. Following this the dams will be removed.
- The surface water discharge point is likely to take less than one day to install. During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- The Kildare Bridge upgrade works will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent, where considered necessary by the designer.

Prior to entering the works area, all machinery and personnel entering the works area will be thoroughly disinfected.

Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Fauna- Disturbance/habitat loss

Non-volant mammals not identified as KERs

The construction phase of the proposal has the potential for some disturbance to local faunal species. However, no significant faunal species or signs of significant mammal activity were recorded within or immediately adjacent to the proposal during the site visit.

The proposed development site is located in close proximity to the busy roads and existing residential housing developments. Local faunal species are therefore likely to be habituated to anthropogenic activity in the wider area. Impacts on fauna as a result of disturbance during the construction phase are not considered to be significant at any geographic scale.

Best practice measures

- All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crespular or nocturnal species, including bat species.
- Hoarding will be placed around the construction site. This will screen the site and any disturbance impacts on fauna in the wider surroundings.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant machinery will be turned off when not in use.
- Operating machinery will be restricted to the proposed works site area.

Residual Effect

No significant effect

Assessment on the potential impacts on bats during construction

Table 6-38. Potential impacts on bats during construction associated with site C

Description of Effect	**Habitat Loss** Trees within the development boundary, which are proposed to be felled, were inspected to determine their suitability for roosting bats. No signs of bats were observed. However, two trees to the east of the site contained ivy cover and/or small cavities and crevices and were considered to be of *'Low to Moderate'* suitability for bats given their roosting potential. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species.
	Habitat Fragmentation There will be some loss of linear habitat features to facilitate the proposed development. Approximately 1,022m of hedgerow treeline are proposed for removal. However, significant additional planting is proposed. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species. Potential effects on bats may include: Removal of potential commuting or foraging habitat through the felling of trees.
	Disturbance Construction of the proposed development will result in increased human activity, noise and lighting within the proposed development site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is bordered by existing residential and commercial developments to south, as well as busy local road and adjacent amenity areas. It is likely that bat species in the area are accustomed to some levels of disturbance. In the absence of appropriate design, the development has the potential to disturb bats by illumination of commuting and foraging areas.
Characterisation of unmitigated effect	The construction of the proposed development has the potential to result in a Long-Term Slight Negative effect on the local bat populations in the form of habitat loss, disturbance or direct mortality.
Assessment of Significance prior to mitigation	Significant effects on bats are not anticipated at any geographic scale during the construction of the proposed development.
Mitigation	**Habitat Loss** Following the precautionary principle, a pre-construction survey will be undertaken on two trees to be felled in the east of the site, by a qualified ecologist prior to any works, to ensure there are no roosting bats. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the surveys in July and August 2021. If bats are found to be roosting in any of the structures, a bat derogation licence must be obtained, and further mitigation prescribed by a licenced ecologist.

	Fragmentation **Mitigation** A landscaping plan has been prepared for the proposed development and is available in **Appendix 4-7.** › The tree survey report accompanying this application outlined the removal of 29 trees at the site, many of which have been highlighted for removal due to poor condition. A total of 125 trees will be retained at the site. › In addition to this, 591 new trees will be planted within the site. › This will significantly increase the tree coverage throughout the entire site, improving connectivity to the wider landscape and providing new nesting, foraging and commuting habitat for local biodiversity › The plan includes for the planting of a new native treeline along the southern boundary of the site. To ameliorate any tree loss and to maintain connectivity to the wider area. › Approximately 364m^2 of native hedgerow is proposed for planting along the northern and western boundaries. This will ensure habitat connectivity is maintained to the wider landscape. › Native tree species to be used for planting include Alder (*Alnus glutinosa*), Pedunculate oak (*Quercus robur),* Scots Pine (Pinus sylvestris), Silver Birch (*pendula*) and Rowan (Sorbus aucuparia). › Native hedgerows will be planting with Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Holly (*Ilex aquifolium*). › In addition to native hedgerow and tree planting, approximately 11,492m^2 of shrub planting is proposed throughout the development site. Pollinator friendly species such as *Lavandula angustifolia* and *Hypericum Hidcote* will provide a large increase in food source availability in the proposed shrub planting areas. › Large sections of grasslands throughout the site will be management as Wildflower meadows and planted with native wildflowers, including Common knapweed (*Centaura nigra*), Ribwort Plantain (*Plantago lanceolata*), Red clover (*Trifolium pratense*) and Birds foot trefoil (*Lotus comiculatus*). › The creation of swales will also add new wetland habitat to the landscape, provide new habitat for various invertebrates and amphibians. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. A tree protection plan is included in this application This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance The majority of works, during the construction phase, will occur during daylight hours. Therefore, there will be no requirement for exterior lighting within the site. Where lighting is unavoidable (i.e. health and safety), low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the proposed development, and consequently on bats i.e. Lighting will be directed away from mature trees/hedgerows/treelines around the periphery of the site boundary to minimize disturbance to bats.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.

Potential for Cumulative Effect	The proposed development will not result in any significant effect in regard to habitat loss for bats. It therefore cannot contribute to any cumulative effect in this regard.

Assessment of the potential impacts on birds during construction

Table 6-39. Potential impacts on birds during construction associated with site C

Description of Effect	**Habitat Loss/Degradation** The footprint of the proposal will result in the loss of approximately 0.09ha of woodland habitat along with approx. 1,022m hedgerow and 29 trees. These provide good nesting habitat for a range of common bird species.
	Disturbance The loss of the woodland, hedgerow and tree line throughout the site has the potential to result in disturbance to birds and potentially to cause mortality to juvenile birds in the nest. Moygaddy castle to the northeast of the site provides suitable nesting habitat for barn owl. A dedicated barn owl survey carried out in July 2021 found that no owls were nesting in the tower. Although no works are proposed for the tower, proposed construction works surrounding the tower may result in disturbance on potential nesting barn owl habitat.
Characterisation of unmitigated effect	**Habitat Loss** In the absence of mitigation, the loss of a small area of woodland and linear habitat has the potential to result in a permanent negative effect in respect of bird nesting habitat. This is considered to be a slight effect on this receptor of local importance due to the presence of large areas of suitable habitat in the wider area.
	Disturbance In the absence of mitigation, the loss of woodland and linear features has the potential to result in a short-term negative effect on nesting bird species. The magnitude of this impact has the potential to be moderate if the works result in mortality of young birds in the nest.
Assessment of Significance prior to mitigation	**Habitat Loss** There is no potential for significant effects on this species as a result of habitat loss at any scale.
	Disturbance Whilst there will be no significant effect on birds at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect of disturbance to birds at a local scale during the construction phase of the proposed development prior to mitigation.
Mitigation	**Habitat Loss** In order to mitigate for the loss of a small area of woodland, trees and hedgerow it is proposed to plant and maintain additional areas of native woodland and trees within the site boundary.

	Disturbance Where possible, all cutting of trees, scrub and tall vegetation will be undertaken outside the bird nesting season which runs from the 1st March to the 31st August. Any cutting of vegetation that may be required outside the season described above will be supervised by a suitably qualified ecologist to ensure that no birds nests are present. Should nesting birds be encountered, the trees will be left until nesting activity has concluded. Although no barn owls were recorded during the dedicated barn owl survey carried out in 2021, a pre-construction Survey will be undertaken on Moygaddy castle to ensure no barns owls are nesting there. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the barn owl survey in July 2021.
Residual Effect following Mitigation	**Habitat Loss** – No significant effect
	Disturbance – No significant effect.
Potential for Cumulative Effect	**Habitat Loss** The proposed development will not result in any significant effect in regard to habitat loss for birds. It therefore cannot contribute to any cumulative effect in this regard.

Assessment of the potential impact on badgers during construction

Table 6-40. Potential impacts on badger during construction associated with site C

Description of Effect	**Habitat loss/Fragmentation** Given the nature of the proposed development, there will be some loss of suitable foraging habitat i.e, improved agricultural grasslands.
	Disturbance The main development footprint has been designed to maintain a 30m buffer from the main badger sett along the Blackhall Little River in the centre of the site, in line with NRA (2009). However, a small section of footpath is located 22 metres east of the sett. As such, the construction of the footpath has the potential to cause disturbance of badgers as a result of the proposed construction works. The hedgerow containing the identified outlier sett in the centre of the site will be lost to the development. Although no badger activity was recorded at this sett, there is potential for disturbance and also direct mortality of badgers as a result of the proposed construction works.
Characterisation of unmitigated effect	**Habitat loss/Fragmentation** The loss of agricultural fields is not considered to be significant at any geographical scale, as large areas of grassland will be retained along the southern section of the site and along

	the Blackhall Little River. Large sections of woodland will also remain in the centre of the site.
	Disturbance Construction works to facilitate the development may cause disturbance or direct mortality badgers in the absence of mitigation. The magnitude of this impact has the potential to be moderate if the works result in mortality of badgers.
Assessment of Significance prior to mitigation	**Habitat loss/Fragmentation** No significant overall loss or fragmentation of badger foraging habitat is anticipated at any geographic scale.
	Disturbance Any potential for physical damage or disturbance of occupied setts would has been identified as significant at the local geographic scale in the absence of mitigation.
Mitigation	**Habitat loss/Fragmentation** The retention of the hedgerow, woodland habitat and grassland within the southern section of the site will ensure that badger foraging habitat remains available. Areas seeded with wildflower meadow mix will establish a species rich grassland which is likely to provide higher quality foraging habitat locally than the existing improved agricultural grassland habitat.
	Disturbance A section of footpath is proposed within 22 metres of the identified badger sett along the Blackhall Little River. As such, the following mitigation is prescribed during the construction phase to avoid impacts on badgers: **Mitigation** Badger sett tunnel systems can extend up to c. 20m from sett entrances. Therefore, no heavy machinery will be used within 30m of badger setts (unless carried out under licence); lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances. During the breeding season (December to June inclusive), none of the above works should be undertaken within 50m of active setts nor blasting or pile driving within 150m of active setts. If construction works are required closer to the active sett during the breeding season, consultation with the NPWS will be carried out and appropriate mitigation measures will be put in place, e.g. sett screening, restricted working hours, etc. Although no badger activity was recorded at the outlier sett along the hedgerow within the site, taking a precautionary approach, the following mitigation is prescribed during the construction phase to avoid impacts on badgers: **Mitigation** It is recommended that a pre-construction badger survey be carried out in order to assess activity levels at the outlier sett and to identify any additional sett

	entrances that may have been excavated in the intervening period. All badger survey work will be undertaken in line with current NRA best practice guidance[4] Should this sett found to be in use by badgers during the pre-construction badger monitoring, it will be necessary to apply to NPWS for a licence for the temporary closure of the sett during the construction phase only. Construction activities within the vicinity of affected setts may commence once these setts have been evacuated and destroyed under licence from the NPWS. Where survey indicates that suitable alternative natural setts are not present, a badger expert may recommend the construction of an artificial sett to replace the sett that will be affected.
Residual Effect following Mitigation	**Habitat loss/Fragmentation** Following the incorporation of mitigation measures described above, no significant fragmentation to or loss of badger foraging habitat, is anticipated at any geographic scale.
	Disturbance Following the incorporation of the mitigation measures described above, no significant adverse impacts to badgers is anticipated at any geographic scale.

[4] *National Roads Authority (2006) Guidelines for the treatment of badgers prior to the construction of National Road Schemes.*

Assessment on the potential impacts on Otter during construction

Table 6-41. Potential impacts on Otter during construction.

Description of Effect	The construction of the proposed surface water outfall will require construction works along the edge of the Rye Water River and the Blackhall Little. Although no otter holts were recorded at these locations, following the precautionary principal, the construction works has the potential to cause disturbance or direct mortality to otter. The proposed development also has the potential to result in indirect effects on otter habitat in the form of water pollution resulting from construction activity as described above.
Characterisation of unmitigated effect	Construction works to facilitate the development may cause disturbance or direct mortality otter in the absence of mitigation. The magnitude of this impact has the potential to be moderate if the works result in mortality of otter. In the absence of mitigation, the indirect effect of water pollution on otter during construction has the potential to be a short-term reversible impact. The magnitude of any such impact is likely to be at worst moderate, given that all major infrastructure such as turbine bases and construction compounds are located over 50 metres from any significant watercourse.
Assessment of Significance prior to mitigation	There is no potential for the construction phase of the proposed development to result in significant disturbance, displacement or habitat fragmentation for otter. In the absence of mitigation and following the precautionary principle, there is potential for the proposed development to result in significant indirect effects on otter at a local geographic scale in the form of habitat deterioration resulting from pollution.
Mitigation	Prior to the commencement of construction works associated with the installation of the new pedestrian bridge and outfall, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys undertaken (TII, 2007): From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of the construction of the proposed bridge construction and the construction of the outfall. In the unlikely event that an otter holt is identified within or immediately adjacent to the proposed development footprint, consultation will be undertaken with the National Parks and Wildlife Service and a derogation licence applied for. All conditions of a derogation licence will be implemented in full. No works should be undertaken within 150m of any holts at which breeding females or cubs are present. No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence (TII, 2006[5]). All of the above works will be undertaken or supervised by an appropriately qualified ecologist.
Residual Effect following Mitigation	Following the implementation of mitigation, there will be no significant residual effect on otter as a result of the proposed development.

[5] *NRA, 2006. Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: Transport Infrastructure Ireland. Available at: www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf*

6.7.3.3 Impacts during Operational Phase

Disturbance to Fauna

The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.3.2. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

Assessment on the potential impacts on bats during the operational phase

Table 6-42. Potential Impacts on bats during the operational phase

Description of Effect	Construction and operation of the proposed development will result in increased human activity, noise and lighting within the proposed site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is in close proximity to existing residential areas to south as well as busy local roads. It is likely that bat species in the area are accustomed to some levels of disturbance.
Characterisation of unmitigated effect	In the absence of mitigation, the operational phase of the proposed development has the potential to result in Long-Term Slight Negative effect on the local bat populations in the form of disturbance as a result of lighting.
Assessment of Significance prior to mitigation	Whilst there will be no significant effect on bats at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect on bats at a local scale during the operational phase of the proposed development prior to mitigation.
Mitigation	A lighting plan has been prepared as part of this application › The lighting plan for the operational phase of the proposed development, has been designed with consideration of the following guidelines: Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), Dark Sky Ireland, to minimise light spillage, thus reducing any potential disturbance to bats. › Bat surveys carried out in 2021 indicate the Treeline along the southern boundary of the site is the most important commuting habitat for bats. This linear feature will remain in darkness and not have any artificial lighting. › No lighting is proposed in proximity to the Moygaddy castle and surrounding woodland habitat. › Pedestrian footpaths which are located in close proximity to the Blackhall Little Stream and River Rye Water have been specified to a colour temperature of 2200k. › The proposed lamps have limited backward light properties thus assisting in reducing backward light spill. Lamps have also been specified with 0 Degree tilt (where possible) to ensure limited unwanted light spill.

	› All luminaires are fitted with photocells which automatically switch luminaires on during night time and off during daytime. Additionally, all luminaires are to automatically dim by 75% 00:00 – 06:00 (U14 profile). If required and with agreement of the local authority additional dimming is available. › The proposed lighting design uses warmest available LEDs for chosen luminaires (colour temperature set by worst case luminaires, all luminaires same colour temperature for consistency), the peak wave length is 600nm.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted.

Impacts on water quality during operation

The operational phase of the proposed project will result in the production of foul sewage and surface water runoff.

The proposed surface water drainage system incorporates a number of SUDs measures into its design to block potential pathways for impact on water quality, which are fully described in Chapter 4 of this EIAR.

Wastewater from the development will discharge to the proposed onsite wastewater pumping station, which will ultimately link up to the existing Maynooth town wastewater network prior to discharging to Leixlip Wastewater Treatment Plant. The wastewater treatment plant is regulated and operates under an EPA licence which controls emissions to acceptable levels.

Confirmation of Feasibility letters for Site C have been received from Irish Water and are included in volume 3c appendix 4-9 of this EIAR.

Mitigation

The risk of uncontrolled emissions is minimized by the collection, treatment and discharge of storm water to the Rye Water River and the Blackhall Little Stream via, attenuation tanks, filter drains and petrol/oil interceptors as described above. It is also proposed to retain the existing riparian zone which will act as a buffer between the development and the two watercourses.

Wastewater from the Proposed Development will be directed to an EPA regulated wastewater treatment plant via a proposed onsite pumping station

Residual effect

The potential source of pollution can be readily controlled, and standard procedures will ensure no significant releases will occur. Mitigation measures, in particular the attenuation tank, filter drains, and petrol/oil interceptor will break the pathway from the proposed works areas to the watercourse. The residual impacts are indirect, neutral, imperceptible, long term, unlikely impact.

Foul water discharges will be directed to the municipal sewer and regulated wastewater treatment plant and so the residual impacts are neutral, indirect, imperceptible, long term, unlikely impact.
Therefore, significant effects on surface water or ground water quality will not occur

6.7.3.4 Impacts on European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Potential Impacts on Rye Water Valley/Carton SAC

Site C drains into the Rye Water River to the south and the Blackhall Little within the centre of the site. The Rye Water Valley/Carton SAC is downstream of Site C, to the southeast, directly adjacent to the site boundary on the opposite side of the R157 Regional Road.

The qualifying interests of the SAC is linked to groundwater flows (calcareous tufa springs) There is no connection between groundwater at the development site, and that discharging to any known tufa springs within the SAC (including the mapped spring located approximately 5km from Site Cat Louisa Bridge).

Groundwater below Site C will flow to the south and discharge as baseflow to the Rye Water River and/or the Blackhall Little stream to the east of the housing units. Groundwater flow from the site will, therefore, have no impact on the Louisa Bridge (spring) groundwater flow (Rye Water Valley/Carton SAC) as previous site investigations and hydrological assessments (c.f. Section 2.4, (Hydro-G, 2008)) have shown that the flow to these springs is not derived from the Rye Water River and are in fact fed from a source further east of Louisa Bridge.

Two of the qualifying interests of the SAC are two species of vertigo snail (Vertigo angustior and Vertigo moulinsiana), with both species' dependant on the calcareous march habitat which is provided by the tufa formation. The known range of both species within the SAC is also restricted to Louisa Bridge (spring). While there are no known petrifying springs or qualifying interests of the Rye Water Valley/Carton SAC within proximity of Site A i.e. Louisa Bridge. An ecological walkover survey of the SAC by MKO to identify any additional tufa springs or potential habitat for vertigo snails downstream of the Proposed Development site has not identified petrifying springs nor their associated qualifying interests in this area of the SAC. Irrespective of this the potential for the occurrence of unmapped petrifying springs within the SAC has also been considered below.

Although there is no potential for effects on the known QI of the SAC the following mitigation will ensure no impact on the SAC generally. Standard mitigation and SuDS drainage controls are proposed during the construction and operational phase of Site C (e.g., silt traps/road gullies, hydrocarbon interceptors, attenuation storage and infiltration, and hydro-brake flow limiters) which have been proven through widespread use in housing and commercial developments across the country. The proposed SuDs drainage system incorporated into the engineering design of the site are common drainage systems that are used in development sites. They are proposed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005) and the objectives outlined in the Meath County Development Plan 2021-2027.

These standard drainage design controls and construction phase mitigation measures will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing

greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the proposed development.

The project design ensures that there will be no dewatering of the bedrock aquifer during the construction phase and so there will be no obstruction or alteration of existing groundwater flows.

There will be no significant alteration to groundwater recharge. The majority of rainfall will continue to percolate to shallow subsurface and discharge to the surface water systems locally with low levels of recharge to ground, in particular for Site C with is underlain with low permeability subsoils. During the construction phase, the recharge rates won't change materially.

With the implementation of the project as designed and the standard drainage control measures outlined above the potential for Site C to cause any groundwater drawdown or groundwater quality impacts in the SAC is imperceptible.

Groundwater flowpaths will be maintained during the construction phase as any excavation proposed will be shallow. The SI data shows that dewatering of groundwater from the bedrock aquifer will not occur and so there is no potential for significant effects on the calcareous tufa springs and associated species.

Following an extremely precautionary principle, the potential for other downstream designated sites (South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA) to be impacted by the proposed works was also considered. On the basis of the Proposed Development design and the mitigation measures proposed to protect the immediate water receptors there will be no impacts on designated sites.

Pathway: Site drainage network and groundwater flowpaths.

Receptor: Rye Water Valley/Carton SAC and any associated Tufa Springs and vertigo snail populations (including the known spring 5km downstream at Louisa Bridge).

Pre-Mitigation Impact

Indirect, negative, slight, short term, likely impact to water quality and hydrology regime.

Proposed Mitigation Measures

The proposed mitigation measures for protection of surface water and groundwater quality which will include on site drainage control measures (i.e., silt fences, silt bags etc.) will ensure that the quality of runoff from Proposed Development areas will be good. All mitigation measures outlined throughout Section 8.6.3 of Chapter 8 provides controls which will be put in place to manage risks associated with sediment, hydrocarbons/chemicals and cement-based products used during construction phase.

The standard drainage design controls will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the Proposed Development.

Residual Impact

With the application of the best practice mitigation outlined above, the residual effect will be – Imperceptible, direct, negative, short-term, high probability impact on surface and ground water receptors.

Significance of Effects

For the reasons outlined above, no significant effects will occur on any designated site.

The NIS report concludes that:

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation of the proposed development does not adversely affect the integrity of European sites.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site."

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Those nationally designated sites that were also designated as SACs/SPAs were considered and the potential for significant or adverse effects to occur were discounted on the same basis as described above in relation to the corresponding European Sites. Where there are pathways for effect on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

The proposed development site is located directly adjacent to the Rye Water Valley/Carton NHA, which is also designated as Rye Water Valley/Carton SAC.

Liffey Valley pNHA located downstream of the proposed development with hydrological connectivity via the Rye Water River and River Liffey.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapter 4 and section 8.6 of Chapter 8 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Chapter 4 and section 8.6 of Chapter 8 of this EIAR.

6.7.4 MOOR- Maynooth Outer Orbital Road

6.7.4.1 Do Nothing Impact

If the proposed development were not to go ahead, it is likely that the development site would remain as it is in its current agricultural use. The development site may be subject to other development proposals.

6.7.4.2 *Impacts during Construction phase*

Habitat Loss

Habitats Local Importance (Lower Value)

Table 6-43.Habitats of Local Importance (Lower value)

Habitat	Area lost / Length lost
Improved Agricultural Grassland (GA1)	3.6ha

The development footprint will result in the permanent loss of Improved Agricultural Grassland

The effect is assessed a permanent non-significant negative impact on a receptor of *Local Importance Lower Value*. Loss of this habitat to the footprint of the proposal is not considered to be significant at any geographic scale. This habitat is common and widespread in the locality and have a low biodiversity value. The loss of this habitat is considered not significant and therefore no mitigation is required.

Habitats Local Importance (Higher Value)

The habitats of local importance (higher value) that will be lost to the development and the area/length of each habitat lost are listed in Table 6.44.

Table 6-44. Habitat of Local Importance (Higher Value)

Habitat	Area/length lost
Treeline (WL2)	Approx. 1,253m
Hedgerow (WL1)	Approx. 1,563m

Assessment of the potential effects on the loss of Hedgerow (WL1) and Treeline (WL2) habitat

Table 6-45. Loss of Treeline and Hedgerow habitat associated with the MOOR

Description of Effect	The MOOR has been designed to retain trees and hedgerow habitat where possible. Approximately 1, 253m of treeline and 1,563m of hedgerow will be lost to facilitate the construction of the MOOR. This includes for treeline and hedgerow along the R157, L22143 and delineating field boundaries.
Characterisation of unmitigated effect	The loss of 1, 253m of treeline and 1,563m of hedgerow would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is significant at the local scale given the area affected.
Assessment of Significance prior to mitigation	This is not significant at a county, national or international scale as it will not affect the conservation status of this habitat, which is widespread and common in the wider area outside the site.
Mitigation	**Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › In order to mitigate for the significant loss of hedgerow habitat associated with the MOOR, approximately 6,208m of new hedgerow will be planting along the extend off the MOOR boundary. › Native hedgerow species such as Hawthorn (*Crataegus monogyna*), Blackthorn (Prunus spinosa) and Holly (*Ilex aquifolium*) will in the replanting schedule. › In addition to the 6,208m of new hedgerow proposed, 373 semi mature new trees will also be planted along the extent of the MOOR. › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The planting of 6,208m of hedgerow habitat and 373 semi mature trees will increase the coverage of linear habitat on the overall proposed development site. › This will significantly increase the nesting, foraging and commuting habitat for wildlife while maintaining ecological connectivity to the wider landscape. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
Residual Effect following Mitigation	Following the implementation of the mitigation and compensation as described above, there will be no net loss of hedgerow or treeline habitat on the site. The residual impact on hedgerow will be a short term slight negative effect until the newly planted hedges and semi mature trees develop and mature. Ultimately, there will be no residual significant effect on the hedgerow and treeline habitat as a result of the development.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long term loss of linear landscape features. It therefore cannot contribute to any significant cumulative effect in this regard

Assessment of potential effects on water quality and aquatic faunal species and habitats during construction

Table 6-46. Potential impacts on water during construction

Description of Effect	The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. The construction of the river bridges crossing at Moyglare and the Rye Water and the Blackhall little river have the potential to result in the deterioration of water quality. The Rye Water River flows into the River Rye/Carton Valley SAC, located east of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Blackhall Little Stream, Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality are anticipated could occur at a local level as a result of the construction works, prior to should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of the main development areas have been outlined in section 8.6.3.7 of Chapter 8 of this EIAR and are fully described in the CEMP located in Volume 3.d, Appendix 4-3. The mitigation measures are summarised below. › Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats. › A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities. › The silt fence will comprise a geotextile membrane that will buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated. › As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground; › Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing; › A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run- off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled.

These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.

- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;
- No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland is incorporated into the design of the proposed Kildare Bridge pedestrian/cycle structure upgrade works, the Blackhall Little Bridge and the Moyglare Bridge;
- Surface water outfalls will be constructed in accordance with the measures described in 8.6.3.4.4 and subject to agreement with IFI.
- Good construction practices such wheel washers and dust suppression on site roads, and regular plant maintenance, which will be implemented, will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRlA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.
- During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and,
- The MOOR stream crossing upgrade works, the Moyglare Bridge and the Kildare Bridge Works will all require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent, where considered necessary by the designer.
- Preventative measures during construction have been incorporated into the Construction and Environmental Management Plan, which will be updated upon grant of permission and to provide any additional measures required pursuant to planning conditions and agreements with the planning authority.

The following best practice construction measures will be followed to ensure that there are no significant effects on the Rye Water River as a result of the construction of the two pedestrian and cycle bridges:

- The proposed design for water course crossings and culverts, which minimises interactions with water courses, ensures that there will be no perceptible effects on the morphology of those watercourses.
- Prior to the outset of these works, small defined works areas will be fenced off at the location of the storm water outfall (between the main construction site and both water courses). Silt fences will be attached to these fences. The silt fence will provide a solid barrier between the proposed pipelaying works and the Rye Water River
- The necessary pipelaying works will be undertaken within this defined area.
- Following the installation of the pipework and reinstatement of the ground, the small section of the silt fence that protects the Rye Water River will be removed to facilitate the construction of the outfall.
- No instream works will take place outside the period July 31st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- Cofferdams will be constructed using one tonne sandbags at the edge of the Rye Water River at the outfall point to create dry working areas.
- A submersible pump will be used to dewater inside the cofferdammed area and will discharge any waters to land at a location of over 30m from the rivers. The pumped waters will discharge through a silt bag.
- The bankside will be excavated and a small pre-cast concrete headwall installed (with outfall pipe included).

	› The banks and channel bed will be reinstated to avoid erosion or run off of silt. Following this the dams will be removed. › The surface water discharge point is likely to take less than one day to install › The bridge works will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent, where considered necessary by the designer. › Prior to entering the works area, all machinery and personnel entering the works area will be thoroughly disinfected. As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the Blackhall Little and the River Rye Water.
	Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage: Biotic and abiotic baseline data will be gathered on the River Rye and Blackhall Little both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Fauna- Disturbance/Habitat loss

Non volant mammals

The construction phase of the proposal has the potential for some localised disturbance to local faunal species. However, no significant faunal species or signs of significant mammal activity were recorded within or immediately adjacent to the proposal during the site visit.

The proposed development site is located in close proximity to the busy roads and existing residential housing developments. Local faunal species are therefore likely to be habituated to anthropogenic activity in the wider area. Impacts on fauna as a result of disturbance during the construction phase are not considered to be significant at any geographic scale.

Best practice measures

- All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crespular or nocturnal species, including bat species.
- Hoarding will be placed around the construction site. This will screen the site and minimise any disturbance impacts on fauna in the wider surroundings.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant machinery will be turned off when not in use.
- Operating machinery will be restricted to the proposed works site area.

Residual Effect

No significant effect

Assessment on the potential impacts on bats during construction

Table 6-47. Assessment of the potential impacts on bats associated with the MOOR

Description of Effect	**Habitat Loss** Trees within the development boundary, which are proposed to be felled, were inspected to determine their suitability for roosting bats. No signs of bats were observed. One individual tree adjacent to the Blackhall Little stream in the north section of the MOOR contained ivy cover and/or small cavities and crevices and were considered to be of 'Low to Moderate' suitability for bats given their roosting potential. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species.
	Habitat Fragmentation There will be a loss of linear habitat features to facilitate the proposed development. Approximately 1, 253m of treeline and 1,563m of hedgerow are proposed for removal. However, significant additional planting is proposed. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species. Potential effects on bats may include: Removal of potential commuting or foraging habitat through the felling of trees.
	Disturbance Construction of the proposed development will result in increased human activity, noise and lighting within the proposed development site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is bordered by existing residential and commercial developments to south, as well as busy local road and adjacent amenity areas. It is likely that bat species in the area are accustomed to some levels of disturbance. In the absence of appropriate design, the development has the potential to disturb bats by illumination of commuting and foraging areas.
Characterisation of unmitigated effect	The construction of the proposed development has the potential to result in a Long-Term Slight Negative effect on the local bat populations in the form of habitat loss, disturbance or direct mortality.
Assessment of Significance prior to mitigation	Significant effects on bats are not anticipated at any geographic scale during the construction of the proposed development.
Mitigation	**Habitat Loss** › Following the precautionary principle, a pre-construction survey will be undertaken on the individual tree adjacent to the Blackhall Little stream with 'Low to Moderate' suitability for bats to be felled, by a qualified ecologist prior to any works, to ensure there are no roosting bats. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the bat survey in July 2021. › If bats are found to be roosting in any of the trees, a bat derogation licence must be obtained, and further mitigation prescribed by a licenced ecologist.

	› Tree felling will follow guidelines set out in National Roads Authority, Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. 2006.
	Fragmentation **Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › In order to mitigate for the significant loss of hedgerow habitat associated with the MOOR, approximately 6,208m of new hedgerow will be planting along the extend off the MOOR boundary. › Native hedgerow species such as Hawthorn (*Crataegus monogyna*), Blackthorn (Prunus spinosa) and Holly (*Ilex aquifolium*) will in the replanting schedule. › In addition to the 6,208m of new hedgerow proposed, 373 semi mature new trees will also be planted along the extent of the MOOR. › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The planting of 6,208m of hedgerow habitat and 373 semi mature trees will increase the coverage of linear habitat on the overall proposed development site. › This will significantly increase the nesting, foraging and commuting habitat for wildlife while maintaining ecological connectivity to the wider landscape. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. A tree protection plan is included in this application. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance The majority of works, during the construction phase, will occur during daylight hours. Therefore, there will be no requirement for exterior lighting within the site. Where lighting is unavoidable (i.e. health and safety), low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the proposed development, and consequently on bats i.e. Lighting will be directed away from mature trees/hedgerows/treelines around the periphery of the site boundary to minimize disturbance to bats.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effect in regard to habitat loss for bats. It therefore cannot contribute to any cumulative effect in this regard.

Assessment on the potential impacts on birds during construction

Table 6-48. Potential impacts on birds during the construction phase of site B

Description of Effect	**Habitat Loss/Degradation** The footprint of the proposal will result in the loss of approximately 1, 253m of treeline and 1,563m of hedgerow in the MOOR site are also proposed for removal. This provides good nesting habitat for a range of common bird species.
	Disturbance The loss of 21, 253m of treeline and 1,563m of hedgerow and throughout the site has the potential to result in disturbance to birds and potentially to cause mortality to juvenile birds in the nest
Characterisation of unmitigated effect	**Habitat Loss** In the absence of mitigation, the loss of 1, 253m of treeline and 1,563m of hedgerow has the potential to result in a permanent negative effect in respect of bird nesting habitat. This is considered to be a Moderate effect on this receptor of local importance due to the presence of large areas of suitable habitat in the wider area.
	Disturbance In the absence of mitigation, the loss of 1, 253m of treeline and 1,563m of hedgerow has the potential to result in a short-term negative effect on nesting bird species. The magnitude of this impact has the potential to be moderate if the works result in mortality of young birds in the nest.
Assessment of Significance prior to mitigation	**Habitat Loss** There is no potential for significant effects on this species as a result of habitat loss at any scale.
	Disturbance Whilst there will be no significant effect on birds at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect of disturbance to birds at a local scale during the construction phase of the proposed development prior to mitigation.
Mitigation	**Habitat Loss** **Mitigation** A landscaping plan has been prepared for both application sites and is available in **Appendix 4-7.** › In order to mitigate for the significant loss of hedgerow habitat associated with the MOOR, approximately 6,208m of new hedgerow will be planting along the extend off the MOOR boundary. › Native hedgerow species such as Hawthorn (*Crataegus monogyna*), Blackthorn (Prunus spinosa) and Holly (*Ilex aquifolium*) will in the replanting schedule. › In addition to the 6,208m of new hedgerow proposed, 373 semi mature new trees will also be planted along the extent of the MOOR. › Native species to be used for planting include Alder (*Alnus glutinosa),* Pedunculate oak (*Quercus robur*), Scots Pine (*Pinus sylvestris*), Silver Birch (*betula pendula*) and Rowan (*Sorbus aucuparia*). › The planting of 6,208m of hedgerow habitat and 373 semi mature trees will increase the coverage of linear habitat on the overall proposed development site.

	› This will significantly increase the nesting, foraging and commuting habitat for wildlife while maintaining ecological connectivity to the wider landscape. › The construction area within the site will be fenced off at the outset of construction. There will be no construction activities, access or storage of materials in the area outside the defined construction site. › A tree protection plan is included in this application. This will ensure that any trees or tree lines that are to be retained within the site are fully protected in accordance with the British Standard BS 5837: Trees in Relation to Construction.
	Disturbance Where possible, all cutting of trees, scrub and tall vegetation will be undertaken outside the bird nesting season which runs from the 1st March to the 31st August. Any cutting of vegetation that may be required outside the season described above will be supervised by a suitably qualified ecologist to ensure that no birds nests are present. Should nesting birds be encountered, the trees will be left until nesting activity has concluded.
Residual Effect following Mitigation	**Habitat Loss** – No significant effect
	Disturbance – No significant effect.
Potential for Cumulative Effect	**Habitat Loss** The proposed development will not result in any significant effect in regard to habitat loss for birds. It therefore cannot contribute to any cumulative effect in this regard.

6.7.4.3 Impacts during operational phase

Disturbance to Fauna

The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.4.2. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

Assessment of the potential impact on bats during the operational phase

Table 6-49. Assessment of potential impacts on bats during the operational phase

Description of Effect	Construction and operation of the proposed development will result in increased human activity, noise and lighting within the proposed site. Therefore, the potential for disturbance to bats requires consideration.

	However, the proposed development is in close proximity to existing residential areas to south as well as busy local roads. It is likely that bat species in the area are accustomed to some levels of disturbance.
Characterisation of unmitigated effect	In the absence of mitigation, the operational phase of the proposed development has the potential to result in Long-Term Slight Negative effect on the local bat populations in the form of disturbance as a result of lighting.
Assessment of Significance prior to mitigation	Whilst there will be no significant effect on bats at an international or national scale, following the precautionary principal, there is the potential for a significant negative effect on bats at a local scale during the operational phase of the proposed development prior to mitigation.
Mitigation	Bat surveys carried out in identified the treeline along the southern boundary of the MOOR to be the most important commuting habitat for bats across both sites. This habitat is being retained and will not be subject to artificial lighting. A lighting plan has been prepared as part of the MOOR application. › The lighting plan for the operational phase of the proposed development, has been designed with consideration of the following guidelines: Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), Dark Sky Ireland, to minimise light spillage, thus reducing any potential disturbance to bats. › The proposed lamps have limited backward light properties thus assisting in reducing backward light spill. Lamps have also been specified with 0 Degree tilt (where possible) to ensure limited unwanted light spill. › Bat survey results from 2021 indicate the most important commuting habitat for bats within the proposed development site is the treeline along the southern boundary with high levels of activity also recorded at Moygaddy castle. These areas will not be subject to artificial lighting and will remain in darkness. › All luminaires are fitted with photocells which automatically switch luminaires on during night time and off during daytime. Additionally, all luminaires are to automatically dim by 75% 00:00 – 06:00 (U14 profile). If required and with agreement of the local authority additional dimming is available. › The proposed lighting design uses warmest available LEDs for chosen luminaires (colour temperature set by worst case luminaires, all luminaires same colour temperature for consistency), the peak wavelength is 600nm.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted.

Impacts on water quality during the operational

The operational phase of the MOOR will have the potential to result in increased surface water runoff. In the absence of mitigation, replacement of the greenfield surface with hardstand surfaces would result in an increased risk of pluvial flooding due to low permeability surfaces which will inhibit any downward percolation of rainwater. Furthermore, in the absence of mitigation measures the

uncontrolled discharge of water to the Rye Water River could result in an increased risk of downstream fluvial flooding due to increased peak discharges in the river.

A full list of mitigation measures outlined to prevent surface and groundwater pollution during the operational phase of the MOOR is described in section 8.6.4.11 of chapter 8.

Mitigation

The risk of uncontrolled emissions is minimized by the collection, treatment and discharge of storm water to the Rye Water River and Blackhall Little via, attenuation tanks, filter drains and petrol/oil interceptors as described above. It is also proposed to retain the existing riparian zone which will act as a buffer between the development and that stream.

Residual effect

The potential source of pollution can be readily controlled, and standard procedures will ensure no significant releases will occur. Mitigation measures, in particular the attenuation tank, filter drains, and petrol/oil interceptor will break the pathway from the proposed works areas to the watercourse. The residual impacts are indirect, neutral, imperceptible, long term, unlikely impact.

Therefore, significant effects on surface water or ground water quality will not occur

6.7.4.4 Impacts on European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Potential Impacts on Rye Water Valley/Carton SAC

The MOOR drains into the Rye Water River to the south and along the Blackhall Little Stream. The Rye Water Valley/Carton SAC is downstream of the MOOR, to the southeast, directly adjacent to the site boundary on the opposite side of the R157 Regional Road.

The qualifying interests of the SAC is linked to groundwater flows (calcareous tufa springs) There is no connection between groundwater at the development site, and that discharging to any known tufa springs within the SAC (including the mapped spring located approximately 5km from the MOOR at Louisa Bridge).

Groundwater below the MOOR will flow to the south and discharge as baseflow to the Rye Water River and/or the Blackhall Little stream to the centre of the site. Groundwater flow from the site will, therefore, have no impact on the Louisa Bridge (spring) groundwater flow (Rye Water Valley/Carton SAC) as previous site investigations and hydrological assessments (c.f. Section 2.4, (Hydro-G, 2008)) have shown that the flow to these springs is not derived from the Rye Water River and are in fact fed from a source further east of Louisa Bridge.

Two of the qualifying interests of the SAC are two species of vertigo snail (Vertigo angustior and Vertigo moulinsiana), with both species' dependant on the calcareous march habitat which is provided

by the tufa formation. The known range of both species within the SAC is also restricted to Louisa Bridge (spring). While there are no known petrifying springs or qualifying interests of the Rye Water Valley/Carton SAC within proximity of Site A i.e. Louisa Bridge. An ecological walkover survey of the SAC by MKO to identify any additional tufa springs or potential habitat for vertigo snails downstream of the Proposed Development site has not identified petrifying springs nor their associated qualifying interests in this area of the SAC. Irrespective of this the potential for the occurrence of unmapped petrifying springs within the SAC has also been considered below.

Although there is no potential for effects on the known QI of the SAC the following mitigation will ensure no impact on the SAC generally. Standard mitigation and SuDS drainage controls are proposed during the construction and operational phase of the MOOR (e.g., silt traps/road gullies, hydrocarbon interceptors, attenuation storage and infiltration, and hydro-brake flow limiters) which have been proven through widespread use in housing and commercial developments across the country. The proposed SuDs drainage system incorporated into the engineering design of the site are common drainage systems that are used in development sites. They are proposed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005) and the objectives outlined in the Meath County Development Plan 2021-2027.

These standard drainage design controls and construction phase mitigation measures will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the proposed development.

The project design ensures that there will be no dewatering of the bedrock aquifer during the construction phase and so there will be no obstruction or alteration of existing groundwater flows.

There will be no significant alteration to groundwater recharge. The majority of rainfall will continue to percolate to shallow subsurface and discharge to the surface water systems locally with low levels of recharge to ground, in particular for the MOOR with is underlain with low permeability subsoils. During the construction phase, the recharge rates won't change materially.

With the implementation of the project as designed and the standard drainage control measures outlined above the potential for the MOOR to cause any groundwater drawdown or groundwater quality impacts in the SAC is imperceptible.

Groundwater flowpaths will be maintained during the construction phase as any excavation proposed will be shallow. The SI data shows that dewatering of groundwater from the bedrock aquifer will not occur and so there is no potential for significant effects on the calcareous tufa springs and associated species.

Following an extremely precautionary principle, the potential for other downstream designated sites (South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA) to be impacted by the proposed works was also considered. On the basis of the Proposed Development design and the mitigation measures proposed to protect the immediate water receptors there will be no impacts on designated sites.

Pathway: Site drainage network and groundwater flowpaths.

Receptor: Rye Water Valley/Carton SAC and any associated Tufa Springs and vertigo snail populations (including the known spring 5km downstream at Louisa Bridge).

Pre-Mitigation Impact

Indirect, negative, slight, short term, likely impact to water quality and hydrology regime.

Proposed Mitigation Measures

The proposed mitigation measures for protection of surface water and groundwater quality which will include on site drainage control measures (i.e., silt fences, silt bags etc.) will ensure that the quality of runoff from Proposed Development areas will be good. All mitigation measures outlined throughout Section 8.6.3 of Chapter 8 provides controls which will be put in place to manage risks associated with sediment, hydrocarbons/chemicals and cement-based products used during construction phase.

The standard drainage design controls will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the Proposed Development.

Residual Impact

With the application of the best practice mitigation outlined above, the residual effect will be – Imperceptible, direct, negative, short-term, high probability impact on surface and ground water receptors.

Significance of Effects

For the reasons outlined above, no significant effects will occur on any designated site.

The NIS report concludes that:

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation of the proposed development does not adversely affect the integrity of European sites.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site."

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Those nationally designated sites that were also designated as SACs/SPAs were considered and the potential for significant or adverse effects to occur were discounted on the same basis as described above in relation to the corresponding European Sites. Where there are pathways for effect

on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

The proposed development site is located directly adjacent to the Rye Water Valley/Carton NHA, which is also designated as Rye Water Valley/Carton SAC.

Liffey Valley pNHA located downstream of the proposed development with hydrological connectivity via the Rye Water River and River Liffey.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapter 4 and section 8.6 of Chapter 8 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Chapter 4 and section 8.6 of Chapter 8 of this report.

6.7.5 Kildare Bridge

6.7.5.1 Impacts during Construction phase

Habitat Loss

The habitats of local importance (higher value) that will be lost to the development and the area/length of each habitat lost are listed in Table 6.50.

Table 6-50. Habitat of Local Importance (Higher Value) recorded in site A

Habitat	Area lost / Length lost
Treeline (WL2)	8m

Assessment of the potential effects on the loss of Treeline (WL2) habitat

Table 6-51. Loss of Treeline and Hedgerow habitat associated within site A

Description of Effect	The proposed development will result in approximately 8m of Treeline habitat at the location of the new proposed Pedestrian and Cycle Bridge, adjacent to the existing Kildare bridge. This represents 0.6% of the total Treeline habitat present the Rye Water River within the development site.
Characterisation of unmitigated effect	The loss of 8m of treeline would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is imperceptible at the local scale given the small area affected.
Assessment of Significance prior to mitigation	This is not significant at a county, national or international scale as it will not affect the conservation status of this habitat, which is widespread and common in the wider area outside the site.
Mitigation	The construction works required at the Kildare bridge will results in the loss of only 8m of treeline habitat, which represents a tiny fraction (0.6%) of the total treeline habitat along the Rye Water River. As part of the Kildare bridge application, there is no landscape report prepared, however, the landscaping plan for site B outlines additional hedgerow planting directly adjacent to the Kildare bridge. As a result, there will be a large increase in treeline and hedgerow coverage in the area.
Residual Effect following Mitigation	Following the implementation of the mitigation as described above, the impact on treelines and hedgerows is reduced to a permanent slight negative effect. There will be no significant residual effect on linear landscape features at any geographic scale as a result of this development.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long term loss of linear landscape features. It therefore cannot contribute to any significant cumulative effect in this regard

Assessment of potential effects on water quality and aquatic faunal species and habitats during construction

Table 6-52. Assessment of the potential impact on water quality and aquatic fauna during construction

Description of Effect	The construction of the Kildare Bridge crossing has the potential to result in the deterioration of water quality. The Rye Water River flows into the River Rye/Carton Valley SAC, located east of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Blackhall Little Stream, Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality could occur at a local level as a result of the construction works, should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of the main development areas have been outlined in section 8.6.3.9 of Chapter 8 of this EIAR and are fully described in the CEMP located in Volume 3.e, Appendix 4-3. The mitigation measures are summarised below. › Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats. › A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities. › The silt fence will comprise a geotextile membrane that will buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated. › As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground; › Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing; › A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run- off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.

- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;
- No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland is incorporated into the design of the proposed Kildare Bridge pedestrian/cycle structure upgrade works, the Blackhall Little Bridge and the Moyglare Bridge;
- Surface water outfalls will be constructed in accordance with the measures described in Chapter 6 and 8.6.3.4.4 and subject to agreement with IFI.
- Good construction practices such wheel washers and dust suppression on site roads, and regular plant maintenance, which will be implemented, will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRlA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.
- Preventative measures during construction have been incorporated into the Construction and Environmental Management Plan, which will be updated upon grant of permission and to provide any additional measures required pursuant to planning conditions and agreements with the planning authority.

Mitigation for directional drilling

- For directional drilling the area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages.
- Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area;
- Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- Any frac-out material will be contained and removed off-site;

Prior to entering the works area, all machinery and personnel entering the works area will be thoroughly disinfected.

As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the River Rye Water.

Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage:

Biotic and abiotic baseline data will be gathered on the Rye Water River both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.

Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Fauna- Disturbance/Habitat loss

Non volant mammals

The construction phase of the proposal has the potential for some localised disturbance to local faunal species. However, no significant faunal species or signs of significant mammal activity were recorded within or immediately adjacent to the proposal during the site visit.

The proposed development site is located in close proximity to the busy roads and existing residential housing developments. Local faunal species are therefore likely to be habituated to anthropogenic activity in the wider area. Impacts on fauna as a result of disturbance during the construction phase are not considered to be significant at any geographic scale.

Best practice measures

- All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crespular or nocturnal species, including bat species.
- Hoarding will be placed around the construction site. This will screen the site and minimise any disturbance impacts on fauna in the wider surroundings.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant machinery will be turned off when not in use.
- Operating machinery will be restricted to the proposed works site area.

Residual Effect

No significant effect

Assessment on the potential impacts on bats during construction

Table 6-53: Assessment of the potential impacts on bats during construction associated with the Kildare bridge

Description of Effect	**Habitat Fragmentation** There will be some loss of linear habitat features to facilitate the proposed development. Approximately 8m of treeline are proposed for removal. However, significant additional planting is proposed. Following the precautionary principle, the construction phase has the potential to result in some habitat loss to local bat species. Potential effects on bats may include: Removal of potential commuting or foraging habitat through the felling of trees.
	Disturbance Construction of the Kildare bridge will result in increased human activity, noise and lighting within the proposed development site. Therefore, the potential for disturbance to bats requires consideration. However, the proposed development is bordered by existing residential and commercial developments to south, as well as busy local road and adjacent amenity areas. The Kildare bridge was assessed as having *Moderate* suitability for roosting bats, due to the presence of gaps in the stonework. However, no roosting bats were observed during the dedicated survey. It is likely that bat species in the area are accustomed to some levels of disturbance. In the absence of appropriate design, the development has the potential to disturb bats by illumination of commuting and foraging areas.
Characterisation of unmitigated effect	The construction of the proposed development has the potential to result in a Long-Term Slight Negative effect on the local bat populations in the form of habitat loss, disturbance or direct mortality.
Assessment of Significance prior to mitigation	Significant effects on bats are not anticipated at any geographic scale during the construction of the proposed development.
Mitigation	**Fragmentation** The construction works required at the Kildare bridge will results in the loss of only 8m of treeline habitat, which represents a tiny fraction (0.6%) of the total treeline habitat along the Rye Water River. As part of the Kildare bridge application, there is no landscape report prepared, however, the landscaping plan for site B outlines additional hedgerow planting directly adjacent to the Kildare bridge. As a result, there will be a large increase in treeline and hedgerow coverage in the area.
	Disturbance

	The majority of works, during the construction phase, will occur during daylight hours. Therefore, there will be no requirement for exterior lighting within the site. Where lighting is unavoidable (i.e. health and safety), low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the proposed development, and consequently on bats i.e. Lighting will be directed away from mature trees/hedgerows/treelines around the periphery of the site boundary to minimize disturbance to bats. No evidence of bats was recorded at the existing Kildare bridge. However, to account for changes between the completion of the surveys in 2022 and construction works, it is recommended that confirmatory pre-construction surveys are undertaken. The requirement for a pre-construction survey comes from NRA Guidelines For The Treatment Of Bats during The Construction of National Road Schemes. The function of the survey is to assess any changes to the baseline conditions of the water crossings that may have occurred between the surveys and construction stage. The measure does not represent a lacuna in the assessment and is in accordance with industry best practice.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effect in regard to habitat loss for bats. It therefore cannot contribute to any cumulative effect in this regard.

6.7.5.2 Impacts during the Operational Phase

The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.5.1. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. The exiting Kildare bridge is currently subject to artificial lighting via street light. As such, impacts on the local bat population as a result of lighting are not considered to be significant at any geographic scale.

Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

A full list of mitigation measures outlined to prevent surface and groundwater pollution during the operational phase of the Kildare bridge is described in section 8.6.4.13 of chapter 8.

6.7.5.3 Impacts on European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Potential Impacts on Rye Water Valley/Carton SAC

The qualifying interests of the SAC is linked to groundwater flows (calcareous tufa springs) There is no connection between groundwater at the development site, and that discharging to any known tufa springs within the SAC (including the mapped spring located approximately 5km from Kildare Bridge at Louisa Bridge).

Groundwater below Kildare Bridge will discharge as baseflow to the Rye Water River, flow from the site will, therefore, have no impact on the Louisa Bridge (spring) groundwater flow (Rye Water Valley/Carton SAC) as previous site investigations and hydrological assessments (c.f. Section 2.4, (Hydro-G, 2008)) have shown that the flow to these springs is not derived from the Rye Water River and are in fact fed from a source further east of Louisa Bridge.

Two of the qualifying interests of the SAC are two species of vertigo snail (Vertigo angustior and Vertigo moulinsiana), with both species' dependant on the calcareous march habitat which is provided by the tufa formation. The known range of both species within the SAC is also restricted to Louisa Bridge (spring). While there are no known petrifying springs or qualifying interests of the Rye Water Valley/Carton SAC within proximity of Site A i.e. Louisa Bridge. An ecological walkover survey of the SAC by MKO to identify any additional tufa springs or potential habitat for vertigo snails downstream of the Proposed Development site has not identified petrifying springs nor their associated qualifying interests in this area of the SAC. Irrespective of this the potential for the occurrence of unmapped petrifying springs within the SAC has also been considered below.

Although there is no potential for effects on the known QI of the SAC the following mitigation will ensure no impact on the SAC generally. Standard mitigation and SuDS drainage controls are proposed during the construction and operational phase of the Kildare Bridge works areas which have been proven through widespread use in bridge and pipelaying developments across the country. The proposed SuDs drainage system incorporated into the engineering design of the site are common drainage systems that are used in development sites. They are proposed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005) and the objectives outlined in the Meath County Development Plan 2021-2027.

These standard drainage design controls and construction phase mitigation measures will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the proposed development.

The project design ensures that there will be no dewatering of the bedrock aquifer during the construction phase and so there will be no obstruction or alteration of existing groundwater flows.

There will be no significant alteration to groundwater recharge. The majority of rainfall will continue to percolate to shallow subsurface and discharge to the surface water systems locally with low levels of recharge to ground, in particular for Kildare Bridge with is underlain with low permeability subsoils. During the construction phase, the recharge rates won't change materially.

With the implementation of the project as designed and the standard drainage control measures outlined above the potential for Kildare Bridge to cause any groundwater drawdown or groundwater quality impacts in the SAC is imperceptible.

Groundwater flowpaths will be maintained during the construction phase as any excavation proposed will be shallow. The SI data shows that dewatering of groundwater from the bedrock aquifer will not occur and so there is no potential for significant effects on the calcareous tufa springs and associated species.

Following an extremely precautionary principle, the potential for other downstream designated sites (South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA) to be impacted by the proposed works was also considered. On the basis of the Proposed Development design and the mitigation measures proposed to protect the immediate water receptors there will be no impacts on designated sites.

Pathway: Site drainage network and groundwater flowpaths.

Receptor: Rye Water Valley/Carton SAC and any associated Tufa Springs and vertigo snail populations (including the known spring 5km downstream at Louisa Bridge).

Pre-Mitigation Impact

Indirect, negative, slight, short term, likely impact to water quality and hydrology regime.

Proposed Mitigation Measures

The proposed mitigation measures for protection of surface water and groundwater quality which will include on site drainage control measures (i.e., silt fences, silt bags etc.) will ensure that the quality of runoff from Proposed Development areas will be good. All mitigation measures outlined throughout Section 8.6.3 of Chapter 8 provides controls which will be put in place to manage risks associated with sediment, hydrocarbons/chemicals and cement-based products used during construction phase.

The standard drainage design controls will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the Proposed Development.

Residual Impact

With the application of the best practice mitigation outlined above, the residual effect will be – Imperceptible, direct, negative, short-term, high probability impact on surface and ground water receptors.

Significance of Effects

For the reasons outlined above, no significant effects will occur on the designated site.

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation of the proposed development does not adversely affect the integrity of European sites.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site."

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Those nationally designated sites that were also designated as SACs/SPAs were considered and the potential for significant or adverse effects to occur were discounted on the same basis as described above in relation to the corresponding European Sites. Where there are pathways for effect on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

The proposed development site is located directly adjacent to the Rye Water Valley/Carton NHA, which is also designated as Rye Water Valley/Carton SAC.

Liffey Valley pNHA located downstream of the proposed development with hydrological connectivity via the Rye Water River and River Liffey.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapter 4 and section 8.6 of Chapter 8 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Chapter 4 and section 8.6 of Chapter 8 of this EIAR.

6.7.6 Moyglare Bridge

6.7.6.1 Impacts during Construction phase

Habitat Loss

The habitats of local importance (higher value) that will be lost to the development and the area/length of each habitat lost are listed in Table 6.54.

Table 6-54. Habitat of Local Importance (Higher Value) recorded in site A

Habitat	Area lost / Length lost
Treeline	25m

Assessment of the potential effects on the loss of Treeline (WL2) habitat

Table 6-55. Impacts on treeline habitat during the construction phase

Description of Effect	The proposed development will result in approximately 25m of Treeline habitat at the location of the new proposed Bridge at Moyglare, This represents 1.9% of the total Treeline habitat present the Rye Water River within the development site.
Characterisation of unmitigated effect	The loss of 25m of treeline would constitute a permanent negative effect within the site. This would not be reversible as it is within the construction footprint. The magnitude of this impact is imperceptible at the local scale given the small area affected.
Assessment of Significance prior to mitigation	This is not significant at a county, national or international scale as it will not affect the conservation status of this habitat, which is widespread and common in the wider area outside the site.
Mitigation	The construction works required at the Moyglare bridge will results in the loss of only 25m of treeline habitat, which represents a tiny fraction (1.9%) of the total treeline habitat along the Rye Water River. As part of the Moyglare bridge application, there is no landscape report prepared, however, the landscaping plan for site C outlines significant tree planting in the land north of the proposed Moyglare crossing point. As a result, there will be a large increase in treeline coverage in the area. As such, habitat connectivity will be maintain and enhanced to the wider landscape.
Residual Effect following Mitigation	Following the implementation of the mitigation as described above, the impact on treelines and hedgerows is reduced to a permanent slight negative effect. There will be no significant residual effect on linear landscape features at any geographic scale as a result of this development.
Potential for Cumulative Effect	The proposed development will not result in any permanent or long term loss of linear landscape features. It therefore cannot contribute to any significant cumulative effect in this regard

Assessment of potential effects on water quality and aquatic faunal species and habitats during construction

Table 6-56. assessment of the potential impacts on water quality and aquatic species during the construction phase

Description of Effect	The construction of the Moyglare Bridge crossing has the potential to result in the deterioration of water quality. The Rye Water River flows into the River Rye/Carton Valley SAC, located east of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Blackhall Little Stream, Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality could occur at a local level as a result of the construction works, should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of the main development areas have been outlined in section 8.6.3.11 of Chapter 8 of this EIAR and are fully described in the CEMP located in Volume 3.f, Appendix 4-3. The mitigation measures are summarised below. At surface water crossings silt fencing will be constructed around the construction footprint in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint and surface water receptors and associated riparian habitats. › The silt fence will comprise a geotextile membrane that will buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated. › As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground; › Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing; › A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run- off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled.

	These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc. › Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present; › Daily monitoring and inspections of site drainage during construction will be completed; › No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. › All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland is incorporated into the design of the proposed Kildare Bridge pedestrian/cycle structure upgrade works, the Blackhall Little Bridge and the Moyglare Bridge; › Surface water outfalls will be constructed in accordance with the measures described in Chapter 6 and subject to agreement with IFI. › Good construction practices such wheel washers and dust suppression on site roads, and regular plant maintenance, which will be implemented, will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment. › During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and, › The MOOR stream crossing upgrade works, the Moyglare Bridge and the Kildare Bridge Works will all require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent, where considered necessary by the designer. › Preventative measures during construction have been incorporated into the Construction and Environmental Management Plan, which will be updated upon grant of permission and to provide any additional measures required pursuant to planning conditions and agreements with the planning authority. Prior to entering the works area, all machinery and personnel entering the works area will be thoroughly disinfected. As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the Rye Water River .
	Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage: Biotic and abiotic baseline data will be gathered on the Rye Water River both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Fauna- Disturbance/Habitat loss

Non volant mammals

The construction phase of the proposal has the potential for some localised disturbance to local faunal species. However, no significant faunal species or signs of significant mammal activity were recorded within or immediately adjacent to the proposal during the site visit.

The proposed development site is located in close proximity to the busy roads and existing residential housing developments. Local faunal species are therefore likely to be habituated to anthropogenic activity in the wider area. Impacts on fauna as a result of disturbance during the construction phase are not considered to be significant at any geographic scale.

Best practice measures

- All works will be completed during daylight hours and there will be no requirement for artificial lighting at any stage of the proposed construction works. This will avoid any potential impacts on crespular or nocturnal species, including bat species.
- Hoarding will be placed around the construction site. This will screen the site and minimise any disturbance impacts on fauna in the wider surroundings.
- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Plant machinery will be turned off when not in use.
- Operating machinery will be restricted to the proposed works site area.

Residual Effect

No significant effect

6.7.6.2 Impacts during the Operational Phase

The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.5.1. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

The lighting proposal along the Moyglare bridge has been designed to minimise potential disturbance on commuting and foraging bats.

A full list of mitigation measures outlined to prevent surface and groundwater pollution during the operational phase of the Moyglare bridge is described in section 8.5.4.14 of chapter 8.

6.7.6.3 Impacts on European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and

River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Potential Impacts on Rye Water Valley/Carton SAC

The qualifying interests of the SAC is linked to groundwater flows (calcareous tufa springs) There is no connection between groundwater at the development site, and that discharging to any known tufa springs within the SAC (including the mapped spring located approximately 5km from Moyglare Bridge at Louisa Bridge).

Groundwater below Moyglare Bridge will discharge as baseflow to the Rye Water River, flow from the site will, therefore, have no impact on the Louisa Bridge (spring) groundwater flow (Rye Water Valley/Carton SAC) as previous site investigations and hydrological assessments (c.f. Section 2.4, (Hydro-G, 2008)) have shown that the flow to these springs is not derived from the Rye Water River and are in fact fed from a source further east of Louisa Bridge.

Two of the qualifying interests of the SAC are two species of vertigo snail (Vertigo angustior and Vertigo moulinsiana), with both species' dependant on the calcareous march habitat which is provided by the tufa formation. The known range of both species within the SAC is also restricted to Louisa Bridge (spring). While there are no known petrifying springs or qualifying interests of the Rye Water Valley/Carton SAC within proximity of Site A i.e. Louisa Bridge. An ecological walkover survey of the SAC by MKO to identify any additional tufa springs or potential habitat for vertigo snails downstream of the Proposed Development site has not identified petrifying springs nor their associated qualifying interests in this area of the SAC. Irrespective of this the potential for the occurrence of unmapped petrifying springs within the SAC has also been considered below.

Although there is no potential for effects on the known QI of the SAC the following mitigation will ensure no impact on the SAC generally. Standard mitigation and SuDS drainage controls are proposed during the construction and operational phase of Moyglare Bridge (e.g., silt traps/road gullies, hydrocarbon interceptors, attenuation storage and infiltration, and hydro-brake flow limiters) which have been proven through widespread use in road developments across the country. The proposed SuDs drainage system incorporated into the engineering design of the site are common drainage systems that are used in development sites. They are proposed in accordance with the Greater Dublin Strategic Drainage Study (GDSDS, 2005) and the objectives outlined in the Meath County Development Plan 2021-2027.

These standard drainage design controls and construction phase mitigation measures will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the proposed development.

The project design ensures that there will be no dewatering of the bedrock aquifer during the construction phase and so there will be no obstruction or alteration of existing groundwater flows.

There will be no significant alteration to groundwater recharge. The majority of rainfall will continue to percolate to shallow subsurface and discharge to the surface water systems locally with low levels of recharge to ground, in particular for Kildare Bridge with is underlain with low permeability subsoils. During the construction phase, the recharge rates won't change materially.

With the implementation of the project as designed and the standard drainage control measures outlined above the potential for Moyglare Bridge to cause any groundwater drawdown or groundwater quality impacts in the SAC is imperceptible.

Groundwater flowpaths will be maintained during the construction phase as any excavation proposed will be shallow. The SI data shows that dewatering of groundwater from the bedrock aquifer will not occur and so there is no potential for significant effects on the calcareous tufa springs and associated species.

Following an extremely precautionary principle, the potential for other downstream designated sites (South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA)to be impacted by the proposed works was also considered. On the basis of the Proposed Development design and the mitigation measures proposed to protect the immediate water receptors there will be no impacts on designated sites.

Pathway: Site drainage network and groundwater flowpaths.

Receptor: Rye Water Valley/Carton SAC and any associated Tufa Springs and vertigo snail populations (including the known spring 5km downstream at Louisa Bridge).

Pre-Mitigation Impact

Indirect, negative, slight, short term, likely impact to water quality and hydrology regime.

Proposed Mitigation Measures

The proposed mitigation measures for protection of surface water and groundwater quality which will include on site drainage control measures (i.e., silt fences, silt bags etc.) will ensure that the quality of runoff from Proposed Development areas will be good. All mitigation measures outlined throughout Section 8.6.3 of Chapter 8 provides controls which will be put in place to manage risks associated with sediment, hydrocarbons/chemicals and cement-based products used during construction phase.

The standard drainage design controls will ensure the development will not give rise to any significant surface water or groundwater impacts at or downstream of the site or in the SAC. The majority of runoff from the existing site discharges to the river and stream via shallow subsurface flows as shown by the results of the SI investigations and the ground water level data. The drainage design ensures that these discharges will continue at the existing greenfield rates and therefore the hydrological regime locally and regionally will not be affected by the Proposed Development.

Residual Impact

With the application of the best practice mitigation outlined above, the residual effect will be – Imperceptible, direct, negative, short-term, high probability impact on surface and ground water receptors.

Significance of Effects

For the reasons outlined above, no significant effects will occur on the designated site.

"Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction, operation of the proposed development does not adversely affect the integrity of European sites.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site."

Therefore, it can be objectively concluded that the proposed development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site".

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Those nationally designated sites that were also designated as SACs/SPAs were considered and the potential for significant or adverse effects to occur were discounted on the same basis as described above in relation to the corresponding European Sites. Where there are pathways for effect on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

The proposed development site is located directly adjacent to the Rye Water Valley/Carton NHA, which is also designated as Rye Water Valley/Carton SAC.

Liffey Valley pNHA located downstream of the proposed development with hydrological connectivity via the Rye Water River and River Liffey.

Standard best practice environmental control measures have been incorporated in the design of the development and are outlined in Chapter 4 and section 8.6 of Chapter 8 of this EIAR. All identified potential pathways for impact on water quality are robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within Chapter 4 and section 8.6 of Chapter 8 of EIAR.

6.7.7 Cumulative Impacts- Interaction of Effects between Various Elements of the Proposed Development

The potential cumulative impacts from interactions between various elements of the Proposed Development have been considered in terms of impacts on Biodiversity. Due to the proximity, scale and timelines associated with each element, there is potential for cumulative effects with the Proposed Development.

6.7.7.1 Cumulative Impact of habitat loss

The proposed development will result in the loss of treeline, hedgerow and mixed broadleaved woodland throughout the site. Approximately 1,235m of treeline (WL2), 1,920m of hedgerow (WL1) and 0.009ha of mixed broadleaved woodland will be lost. Individual landscaping proposals have been prepared Site A, Site B, Site C and the MOOR application and as the planting proposals are described in sections 6.7.1.2.1, 6.7.2.2.1, 6.7.3.2.2 and 6.7.4.2.1 of the chapter. The Moygaddy masterplan landscaping proposal is available in appendix 4-7 and volumes 3a, 3b, 3c and appendix4-5 in volume 3d.

The proposed development will result in a significant increase in the total coverage of treeline and hedgerow habitat across the entire site. There will be a temporary slight impact on habitats of local importance associated with the construction of the development. However, following the implementation the replanting proposal, no significant effects will occur.

6.7.7.2 Cumulative impacts on water quality and aquatic faunal species and habitats

The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e. the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. The construction of the surface water outfall pipes and the bridges on the Blackhall Little Stream and the within the Rye Water River associated with the development has the potential to result in the deterioration of water quality. The operational phase of the proposed development will result in the production of foul sewage and surface water runoff.

A full description of the proposed mitigation measures for pollution prevention during the construction phase are outlined in section 8.6 of Chapter 8. Six individual Construction Environmental Management (CEMP) have also been prepared for the individual applications. The CEMPs outline site specific mitigation measures that are to be taken to prevent significant effects to water quality and are available in Volume 3.a, appendix 4-3, Volume 3.b appendix 4-3, Volume 3.c appendix 4-3, Volume 3.d, appendix 4-3, Volume 3.e, appendix 4-3 and Volume 3.f, appendix 4-3 of the EIAR.

A full description of the proposed storm and wastewater drainage for the development is described section 4.6 of Chapter 4. Sites A, B & C will direct surface water from surfaced areas roads, and roofs, via gravity, infiltration area/attention storage, hydrocarbon interceptors and filtration drain to a high-level outfall at the Rye Water River, just west of the Kildare Bridge. The remaining areas are considered green space and will be allowed to drain naturally to ground, with negligible impact on the performance of the surface water network, and therefore do not contribute to the surface water drainage networks.

Following the implementation of the prescribed mitigation measures, there is no potential for significant effects on water quality and aquatic faunal species and habitats during the construction or operational phase of the proposed development.

6.7.7.3 Cumulative Impact on fauna

The proposed development will result in the loss of treeline, hedgerow and mixed broadleaved woodland throughout the site. These habitats may be used by local biodiversity for commuting, foraging or purposes. Individual landscaping proposals have been prepared Site A, Site B, Site C and the MOOR application and as the planting proposals are described in sections 6.7.1.2.1, 6.7.2.2.1, 6.7.3.2.2 and 6.7.4.2.1 of the chapter. The proposed development will result in a significant increase in the total coverage of treeline and hedgerow habitat across the entire site. Details of the proposed replanting schedule are described in appendix 4-7. As such, ecological connectivity to the wider landscape will be retained and in certain sections of the site, enhanced. The increase in both native tree and hedgerow coverage will result in the creation of new foraging, nesting and commuting habitat. Native hedgerows will be maintained and managed for wildlife, this includes allowing hedgerows to grow wide and dense at the base, with a wide, uncultivated grassy margin. Hedgerows should be allowed to mature before the first cut and future cutting should happen on a 3/5-year rotation. Hedgerows should be kept as dark spaces to allow commuting and foraging habitat for local wildlife.

Several trees with '*Low to Medium'* Potential Roost Features (PRF) throughout the site will be felled to facilitate the works. A pre-construction survey will be undertaken on all trees with 'Low to Moderate' suitability for bats to be felled, by a qualified ecologist prior to any works, to ensure there are no roosting bats. Individual lighting plans have been prepared for the six separate planning applications. All lightings plans have been designed with consideration of the following guidelines: Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), Dark Sky Ireland, to minimise light spillage, thus reducing any potential disturbance to bats. Important linear features for commuting/foraging bats (i.e treeline in south of site and Moygaddy castle) within the site have been retained and will not be exposed to new artificial lighting.

One active badger sett was recorded within the centre of the site along the Blackhall little stream. The proposed development has been designed to avoid the badger sett and section 6.7.3.2.2 describes the mitigation to be implemented during the construction phase, to avoid potential impacts on badgers.

Following the implementation of the mitigation outlined in section 6.7 of this report, there is no potential for significant effects on faunal species and habitats during the construction or operational phase of the proposed development.

6.7.7.4 Cumulative Impacts on Designated site

European Designated Sites

The potential for impact on European sites has been fully assessed in the Appropriate Assessment NIS that has been prepared in support of the current application.

Following the precautionary principle, the AASR identified a potential pathway for impact on Rye Water Valley/Carton SAC, South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka SPA and North Bull Island SPA in the form of deterioration of surface and groundwater water quality resulting from pollution associated with the construction and operational phases of the development.

Section 8.6 of Chapter 8 outlines a full description of the mitigation measures proposed during the construction and operational phase of the development.

Following the implementation of the mitigation measures, there is no potential for significant effects on any European Sites during the construction or operational phase of the proposed development.

6.7.8 Likely Significant Effects During Decommissioning phase

It is not intended that the proposed buildings will be removed, as permanent planning permission is being sought for this development. The Proposed Development will form an integral part of the local area plan for Moygaddy as outlined in the Meath County Development Plan. Therefore, it is intended that the Proposed Development will be retained as permanent and will not be decommissioned.

Cumulative In-combination

A search and review in relation to plans and projects that may have the potential to result in cumulative and/or in-combination impacts on European Sites was conducted. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

6.7.9 Assessment of Plans

The following development plans been reviewed and taken into consideration as part of this assessment:

Meath County Development Plan 2021-2027
Kildare County Development Plan 2017-2023
Draft Kildare County Development Plan 2023-2027
The County Heritage Plan 2019-2025
The County Biodiversity Plan 2015-2020

Table 6-57 Assessment of Plans

Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Meath County Development Plan 2021-2027	
HER POL 31- To ensure that the ecological impact of all development proposals on habitats and species are appropriately assessed by suitably qualified professional(s) in accordance with best practice guidelines – e.g. the preparation of an Ecological Impact Assessment (EcIA), Screening Statement for Appropriate Assessment, Environmental Impact Assessment, Natura Impact Statement (NIS), species surveys etc. (as appropriate).	The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts on national designated sites including Natural Heritage Areas, Ramsar Sites and Nature Reserves or species protected under the wildlife act were identified when considered in conjunction with the current proposal. No potential for cumulative impacts on EU designated sites or Annex listed protected species were identified when considered in conjunction with the current proposal
HER OBJ 33- To ensure an Appropriate Assessment in accordance with Article 6(3) and Article 6(4) of the Habitats Directives (92/43/EEC) and in accordance with the Department of Environment, Heritage and Local Government Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 2009 and relevant EPA and European Commission guidance documents, is carried out in respect of any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect on a Natura 2000 site(s), either individually or in-combination with other plans or projects, in view of the site's conservation objectives.	
HER OBJ 60- To encourage, pursuant to Article 10 of the Habitats Directive (92/43/EEC), the management of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.	
HER POL 288- To integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.	The strategy was reviewed, with particular reference to Policies and Objectives that relate to biodiversity. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites or biodiversity as a result of the development. Best practice preventative measures will be implemented to avoid effects on biodiversity as outlined in section 6.7 of this report.
HER POL 35- To ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites and to require an appropriate level of ecological assessment by suitably qualified professional(s) to accompany development proposals likely to impact on such areas or species.	
Kildare County Development Plan 2017-2023	
Policy NH2 - Promote the carrying out of basic habitat assessments to inform the design of new developments in order to ensure that proposals for development integrate the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.	The strategy was reviewed, with particular reference to Policies and Objectives that relate to biodiversity. No potential for cumulative
Policy NH04 - Identify, conserve and provide guidance on development in important local biodiversity sites.	

Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
Policy NH8 - Ensure that any proposal for development within or adjacent to a Natural Heritage Area (NHA), Ramsar Sites and Nature Reserves is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the site, particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats.	impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites or biodiversity as a result of the development. Best practice preventative measures will be implemented to avoid effects on biodiversity as outlined in section 6.7 of this report.
Policy GI27- Require all new developments to identify, protect and enhance ecological features by making provision for local biodiversity (e.g. through provision of swift boxes or towers, bat roost sites, green roofs, etc.) and provide links to the wider Green Infrastructure network as an essential part of the design process.	
Draft Kildare County Development Plan 2023-2027	
BI P1 Integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.	The strategy was reviewed, with particular reference to Policies and Objectives that relate to biodiversity. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. A detailed landscaping plan has been prepared for this application outlining the proposed native hedgerow/tree planting. Where any hedgerow/treeline is to be removed, it is proposed to replant it with native species, thus ensuring ecological connectivity is retained. There will be no impact on designated sites or biodiversity as a result of the development. Best practice preventative measures will be implemented to avoid effects on biodiversity as outlined in section 6.7 of this report.
BI O1 Require, as part of the Development Management Process, the preparation of Ecological Impact Assessments that adequately assess the biodiversity resource within proposed development sites, to avoid habitat loss and fragmentation and to integrate this biodiversity resource into the design and layout of new development and to increase biodiversity within the proposed development.	
BI O10 Ensure that any new development proposal does not have a significant adverse impact on rare and threatened species, including those protected under the Wildlife Acts 1976 and 2012, the Birds Directive 1979 the Habitats Directive 1992 and the Flora Protection Order species.	
BI O11 Ensure appropriate species and habitat avoidance and mitigation measures are incorporated into all new development proposals.	
BI O13 Require all applications for new developments to identify, protect and sensitively enhance the most important ecological features and habitats, and incorporate these into the overall open space network, keeping free from development and to provide links to the wider Green Infrastructure network as an essential part of the design process and by making provision for local biodiversity (e.g. through provision of swift boxes or towers, bat roost sites, hedgehog highways2, green roofs, etc.).	
BI O15 Prevent, in the first instance, the removal of hedgerows to facilitate development. Where their removal is unavoidable, same must be clearly and satisfactorily demonstrated to the Planning Authority. In any event, removal shall be kept to an absolute minimum and there shall be a requirement for mitigation planting comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking to existing adjacent hedges. Native plants of a local provenance should be used for any such planting. Removal of hedgerows and trees prior to submitting a planning application will be viewed negatively by the planning authority and may result in an outright refusal.	

Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
BI O16 Promote the integration of boundary hedges within and along development sites into development design so as to avoid "trapped hedges" located to the boundary of houses within the development layout. Encourage the planting of woodlands, trees and hedgerows as part of new developments and as part of the Council's own landscaping works using native plants of local provenance.	
BI O21 Ensure the protection of rivers, streams and other watercourses and, wherever possible, maintain them in an open state capable of providing suitable habitats for fauna and flora while discouraging culverting or realignment. Endeavour to re-open previously culverted streams and watercourses through any future development/redevelopment proposals.	The site layout was designed two maintain an appropriate buffer between the proposed development and the Rye Water River and Blackhall Little which border the site. Inland Fisheries Ireland were consulted at the outset of the design stage. Otter and bat surveys were carried out along the river corridor All proposed works take consideration of the relevant IFI guideline documents. During the operational phase all surface water arising on site will drain to attenuation tanks, hydrocarbon interceptor and filter drain before discharge to Rye Water River and Blackhall Little at less than controlled greenfield rates. Groundwater quality risks are reduced during the operational phase by use of hydrocarbon interceptors and silt traps prior to discharge to the watercourse.
BI O22 Require the preparation and submission of an Ecological Impact Assessment (EcIA) including bat and otter surveys for developments along river or canal corridors.	
BI O23 Consult with Inland Fisheries Ireland (IFI) in relation to any development (greenfield development or redevelopment of brownfield sites) that could potentially impact on the aquatic ecosystems and associated riparian habitats while taking account of 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites' (IFI, 2004) and 'Planning for Watercourses in the Urban Environment' (IFI, 2020).	
BI O27 Ensure that any runoff from developed areas does not result in any deterioration of downstream watercourses or habitats and require that pollution generated by a development is treated within the development area prior to discharge to local watercourses.	
BI O29 Ensure the protection, improvement or restoration of riverine floodplains and to promote strategic measures to accommodate flooding at appropriate locations including nature-based solutions, in order to protect ground and surface water quality and build resilience to climate change.	
BI O5 Avoid development that would adversely affect the integrity of any Natura 2000 site located within and immediately adjacent to the county and promote favourable conservation status of habitats and protected species including those listed under the Birds Directive, the Wildlife Acts and the Habitats Directive, to support the conservation and enhancement of Natura 2000 Sites including any additional sites that may be proposed for designation during the period of this Plan and protect the Natura 2000 network from any plans and projects that are likely to have a significant effect on the coherence or integrity of a Natura 2000 Site.	The Development plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts on national designated sites including Natural Heritage Areas, Ramsar Sites and Nature Reserves or species protected under the wildlife act were identified when considered in conjunction with the current proposal. No potential for cumulative impacts on EU designated sites or Annex listed protected species were identified when considered in conjunction with the current proposal.
BI O6 Ensure an Appropriate Assessment, in accordance with Article 6(3) and Article 6(4) of the Habitats Directive and with DEHLG guidance (2009), is carried out in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site to determine the likelihood of the plan or project having a significant effect on a Natura 2000 site, either individually or in combination with other plans or projects and to ensure that projects which may give rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites will not be permitted (either individually or in combination with other plans or	

Key Policies/Issues/Objectives Directly Related To European Sites, Biodiversity and Sustainable Development In The Zone of Influence	Assessment of development compliance with policy
projects) unless for reasons of overriding public interest.	

6.7.10 Assessment of Projects

The proposed development was considered in-combination with other plans and projects in the area that could result in cumulative impacts on designated Sites. The online National Planning Application Map Viewer was consulted on the 25/03/2022 for the area surrounding the development site.

A full list of the projects within the vicinity, which are of a similar nature and scale, is available in section 2.3 of Chapter 2.

6.8 Conclusion

There will be no significant impacts on biodiversity given the nature, scale and design of the Proposed Development. No significant residual effects on surface water quality, groundwater quality or the local hydrological/hydrogeological regime were identified.

Potential negative effects on water quality and downstream ecological receptors and designated sites have been mitigated through a constraint led design process. With the implementation of best practice measures there will be no impact on water quality. Therefore, following an extremely precautionary principle a pathway for impact on designated sites was identified in the form of potential surface water and ground water pollution. This pathway has been robustly blocked and no potential for residual effects remains.

In the review of the projects that was undertaken, no connection, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Development.

Taking the above information into consideration and having regard to the precautionary principle, it is considered that the Proposed Development will not result in the loss of habitats or species of high ecological significance and will not have any significant effects on the ecology of the wider area.

Provided that the Proposed Development is constructed in accordance with the design and best practice that is described throughout this EIAR, significant effects on biodiversity are not anticipated at any geographic scale.