

6 BIODIVERSITY

6.1 Introduction

The Biodiversity Chapter of the Environmental Impact Assessment Report (EIAR) was authored by Síoifra Quigley of Scott Cawley Ltd.

It provides an assessment of the potential ecological effects of the proposed SHD development at Dunshaughlin (hereafter referred to as the 'proposed development') – refer to Figure 6.1 for location. The proposed development consists of the construction of c. 415no. dwellings, the inclusion of open spaces, site development and landscape work across two sites, north and south of the Drumree Road. A detailed description of the proposed development is included in Chapter 3: Description of Proposed Development.

The proposed development site is located in the 10km Grid Squares N95 at N 95832 52445 and N 95787 52920, to the west of Dunshaughlin town. The northern site consists of improved grassland mainly used for agricultural grazing, while the southern site is also used for grazing by cattle predominately, with some areas of calcareous grassland, bordered by treelines and hedgerows. An attenuation pond exists in the south of the lands, and the River Skane runs along a hedgerow bordering fields, also in the south of the lands. The lands are bordered by Drumree Road (north and south of respective sites), with the M3 Motorway to the west. Newly built residential housing lies adjacent to the southern site, with the wider surroundings comprising of agricultural fields, urban settings which include Dunshaughlin town and other residential areas.



Figure 6.1: The proposed development in relation to wider surroundings.

The purpose of the report is to -

- Establish and evaluate the baseline ecological environment, as relevant to the proposed development.
- Identify, describe and assess all potentially significant ecological effects associated with the proposed development.

- Set out the mitigation measures required to address any potentially significant ecological effects and ensure compliance with relevant nature conservation legislation.
- Provide an assessment of the significance of any residual ecological effects.
- Identify any appropriate compensation, enhancement or post-construction monitoring requirements.

An Appropriate Assessment (AA) Screening was prepared to be submitted with the planning application. It contains information required for the competent authority (in this instance An Bord Pleanála) to undertake a screening for AA. It provides information on and assesses the potential for the proposed development to impact on the Natura 2000 network.

6.1.1 Planning, Policy and Legislation

The collation of ecological baseline data and the preparation of this assessment has had regard to the following legislation and policy documents. This is not an exhaustive list but the most relevant legislative and policy basis for the purposes of preparing this chapter.

The following international legislation is relevant to the proposed development: -

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network¹ was established and special areas of conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which special protection areas are designated for the protection of endangered species of wild birds listed in Annex I of that directive.
- The following national legislation is relevant to the proposed development:
- Wildlife Acts 1976 to 2019; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- Planning and Development Acts 2000 to 2019; hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.

¹ The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.

In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- Flora (Protection) Order, 2015. This lists species of plant protected under Section 21 of the Wildlife Acts.

The following plans and policies are relevant to the proposed development: -

- *National Biodiversity Action Plan 2017-2021* (Department of Culture Heritage and the Gaeltacht, 2017).
- *Meath County Development Plan 2013-2019* (Meath County Council, 2016) with policies relating to Natural Heritage and Green Infrastructure including: -

NH Policy 1: To protect, conserve, and seek to enhance the County's biodiversity.

NH Policy 2: To promote measures to protect biodiversity in the development management process by creating and improving habitats, where possible.

NH Policy 3: To raise public awareness and understanding of the county's natural heritage and biodiversity.

NH Policy 4: To promote increased public participation in biodiversity conservation by supporting and encouraging community-led initiatives.

NH Policy 5: To permit development on or adjacent to designated Special Areas of Conservation, Special Protection Areas, National Heritage Area or those proposed to be designated over the period of the plan, only where an assessment carried out to the satisfaction of the Meath County Council, in consultation with National Parks and Wildlife Service, indicates that it will have no significant adverse effect on the integrity of the site.

NH Policy 6: To have regard to the views and guidance of the National Parks and Wildlife Service in respect of proposed development where there is a possibility that such development may have an impact on a designated European or National site or a site proposed for such designation.

NH Policy 7: To undertake appropriate surveys and collect data to provide an evidence-base to assist Meath County Council in meeting its obligations under Article 6 of the Habitats Directives, subject to available resources.

NH Policy 8: To seek to ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law.

NH Policy 9: To consult with the National Parks and Wildlife Service, and take account of any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law.

NH Policy 13: To encourage the retention of hedgerows and other distinctive boundary treatments in rural areas and prevent loss and fragmentation, where possible. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, mitigation by provision of the same type of boundary will be required.

NH Policy 14: To promote and encourage planting of native hedgerow species of local provenance.

NH Policy 15: To recognise the archaeological importance of townland boundaries including hedgerows and promote their protection and retention.

NH Policy 16: To seek to maintain the natural heritage and amenity of the county by promoting the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees.

NH Policy 17: To encourage the use of native species wherever possible in Meath County Council's own landscaping work, and on Council property.

NH Policy 18: To encourage the retention of mature trees and the use of tree surgery rather than felling where possible when undertaking, approving or authorising development.

GI Policy 1: To recognise the economic, social, environmental and physical value of Green Infrastructure. Chapter 9 Cultural and Natural Assets Meath County Development Plan 2013-2019 184.

GI Policy 2: To protect existing green infrastructure within the County and to provide additional green infrastructure, where possible.

GI Policy 3: To require that all Land Use Plans protect, manage and provide where possible green infrastructure in an integrated and coherent manner.

- *Dunshaughlin Local Area Plan 2013 – 2019* (Meath County Council, 2016). Natural Heritage Policies with this plan include: -

LAP Policy NH 3: To protect and conserve existing hedgerows and prevent loss and fragmentation of ecological corridors where possible. Maintenance and management of hedgerows will be in accordance with best practice guidelines issued by Teagasc and the Heritage Council.

LAP Policy NH 4: To promote the protection and preservation of existing hedgerows and to encourage planting of native hedgerows of native provenance in accordance with the County Development Plan policy HER POL 14.

LAP Policy NH 5: To encourage the retention, where possible, of hedgerows and other distinctive boundary treatments in rural areas. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length set back within the site. This shall also relate to Road Improvements and Realignment carried out by the Local Authorities or agents on their behalf.

LAP Policy NH 6: To recognise the archaeological importance of townland boundaries including hedgerows and promote their protection and retention.

LAP Policy NH 7: Mature trees and hedgerows will be preserved and protected in recognition of the contribution mature trees make to the landscape and character of an area and their value as wildlife corridors. Open space and walkways will incorporate where possible and appropriate existing mature trees and hedgerows and contain new planting to strengthen potential habitat links.

LAP Policy NH 8: Native species (preferably of native genetic stock) will be used where possible in planting schemes in existing and new parks and in open space areas.

LAP Policy NH 11: To use the Meath County Council Dunshaughlin Biodiversity Survey and any future tree survey in determining trees and vegetation to be retained and/or enhanced as part of all future development. The Biodiversity survey will also be used in determining appropriate plant species for new planting.

LAP Policy NH 12: To protect existing ecological corridors including rivers, streams, hedgerows, trees, wooded areas, scrub and traditional stone walls. All proposals for development shall be required to identify all ecological corridors, assess the impact of the proposal on these and set out detailed mitigation measures to offset any negative impact.

LAP Policy NH 13: The use of permeable and porous surfaces which comply with SuDS and the use of French drains is to be encouraged as necessary. The flood plain is a valuable natural resource in the management of floodwaters and the protection of property and productive lands on higher ground; the Council will at all times protect this as the primary role of the floodplain in the LAP area.

LAP Policy NH 14: To conserve and protect the natural habitats and water quality in the River systems within the LAP area, in accordance with the tenets set out in the Eastern River Basin District River Basin Management Plan 2009-2015.

- *County Meath Biodiversity Action Plan 2015-2020* (Meath County Council, 2015). The objectives and actions in the Biodiversity Action Plan relate to the general protection and enhancement of biodiversity but none specifically relate the protection of biodiversity receptors within or adjacent to the proposed development site.

6.2 Assessment Methodology

6.2.1 Author Statement

This Ecological Impact Assessment (EclA) was authored by Síofra Quigley, and reviewed by Shea O'Driscoll and Andrew Speer of Scott Cawley Ltd.

Síofra Quigley is a Consultant Ecologist with Scott Cawley. She obtained an honours degree in Undenominated Science, specialising in Zoology, from National University of Ireland Galway, and a Masters in Wildlife Biology and Conservation from Edinburgh Napier University. She has three years' professional experience working in the UK on large to small scale infrastructure projects, with governmental and private clients. Síofra is experienced in carrying out field surveys in several protected species, including bat, otter, badger, red squirrel, reptile, pine marten and mountain hare. She has also been involved in radio tracking mountain hares and bats, bat call analysis, badger bait marking, acting as an Ecological Clerk of Works, Phase 1 habitat surveys and reports, and desk top studies. Since joining Scott Cawley, Síofra's work involves the preparation of reports, including Ecological Impact Assessment and Appropriate Assessment reports for residential, commercial, and infrastructural projects across Ireland.

Shea O'Driscoll, Consultant Ecologist at Scott Cawley, holds an honours degree in Zoology from University College Dublin and a Masters in Advanced Wildlife Conservation in Practice from the University of the West of England, Bristol. Shea has experience in habitat survey and assessment in a range of terrestrial and aquatic environments, surveys for protected species including otter, bats and badger, he has undertaken a number of ecological clerks of works roles as well as invasive species surveys for public infrastructure works across Ireland. Since joining Scott Cawley in 2017, Shea has gained extensive experience and been the lead author on numerous ecological assessments that include PEA, EclA and AA Screening for a range of projects including tourism, industrial, residential and renewable energy developments.

Andrew Speer is a Technical Director at Scott Cawley Ltd. with over 14 years' professional ecological consultancy experience in preparing Ecological Impact Assessments (EclAs). Andrew is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds a BSc (Hons) in Zoology from the National University of Ireland Galway, a Pg Dip in Geographic Information Systems (GIS) from the University of Ulster and an Adv Dip in Planning & Environmental Law from King's Inns. He has extensive experience in ecological impact assessment and has been the lead author on numerous EclA reports. Andrew also provides technical review and due diligence of EclA documentation for public and local authorities to aid their decision-making process.

6.2.2 Scope of the Assessment

The study area is defined by the zone of influence of the proposed development with respect to the ecological receptors that could potentially be affected.

The Zone of Influence (Zol), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the proposed development site. The Zol and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the proposed development.

The Zol of habitat loss impacts will be confined to within the proposed development boundary.

The Zol of general construction activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the proposed development.

The proposed development site, including the existing (and proposed) surface water drainage network drains to the River Boyne, and therefore, the hydrological Zol potentially extends downstream to the River Boyne Estuary and the Irish Sea.

6.2.3 Desk Study

A desk study was undertaken on the 22 July 2020 to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report: -

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from <https://www.npws.ie/protected-sites> and <https://www.npws.ie/maps-and-data> – refer to Appendix 6.2 and Figure 6.2 and **Error! Reference source not found.** for descriptions and locations of protected sites in the vicinity of the proposed development
- Records of rare and protected species for the 10km grid square(s), as held by the National Biodiversity Data Centre www.biodiversityireland.ie or the NPWS – refer to Appendix 6.2 for all desk study flora and fauna records.
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from <https://myplan.ie/>.
- Ordnance Survey Ireland mapping and aerial photography from <http://map.geohive.ie/>.
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from <https://gis.epa.ie/EPAMaps/>.
- Information on soils, geology and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from <https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx>.
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013).
- Information on the location, nature and design of the proposed development supplied by the applicant's design team.

A consultation letter was submitted by email to Inland Fisheries Ireland on 30 July 2020. The letter included an outline description of the proposed development, and a request for any comments on the proposal. No response was been received by Scott Cawley prior to submission of the SHD Planning Application for the proposed development.

6.2.4 Field Surveys

6.2.4.1 Habitat and Flora Survey

A habitat survey was undertaken of the proposed development site by Síofra Quigley BSc (Hons) MSc and Caroline Kelly BSc (Hons) MSc, both of Scott Cawley Ltd. on the 22 June 2020, following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*². All habitat types were classified using the *Guide to Habitats in Ireland*³, recording the indicator species and abundance using the DAFOR scale⁴ and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of The National Vegetation Database⁵, having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*⁶ and the *British Bryological Society's Mosses and Liverworts of Britain and Ireland: A Field Guide*⁷.

6.2.4.2 Fauna Surveys

Terrestrial Fauna (Excluding Bats)

A terrestrial fauna survey was carried out by Síofra Quigley and Caroline Kelly on the 22 June 2020, for the presence/absence of terrestrial fauna species through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. Surveys included checks for the presence of badger setts and otter holts within the subject lands, and to record any evidence of use.

Breeding Birds

Breeding bird surveys were carried out by John Fox, an independent ornithologist on the 16 and 22 June 2020, and were undertaken using a methodology adapted from the Bird Monitoring Methods - A Manual of Techniques for Key UK Species⁸. The study area covered the lands within the proposed development site, and which were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes. Survey details are provided in Table 6.1.

² Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

³ Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

⁴ The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

⁵ Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

⁶ Stace, C. (2019) *New Flora of the British Isles. 4th Edition*. C&M Floristics.

⁷ Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

⁸ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

Date (Sunrise)	Survey Time (Sunset)	Weather Conditions
16/06/2020 (04:56)	06:10-08:20	Mild, foggy with no wind or rain and moderate visibility throughout with temperatures around 16 °C.
22/06/2020 (04:57)	05:30-08:10	Mild, wet weather with temperatures around 15°C and breezy conditions. Overcast, with showers throughout survey.

Table 6.1: Breeding Bird survey details.

Bats

A ground-level assessment of trees and structures within the subject lands, to examine their suitability to support roosting bats and potential to act as important landscape features for commuting/foraging bats, was based on guidelines (see **Error! Reference source not found.**) in Bat Surveys for Professional Ecologists: Good Practice Guidance (Collins ed., 2016⁹) and included inspections of trees and structures for potential roost features (PRFs), and for signs of bats (staining at roost entrances, droppings, carcasses, insect remains).

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (<i>i.e.</i> unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, <i>i.e.</i> not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.

⁹ Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

Table 6.2: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, applied according to professional judgement. (Taken from Collins (2016).

Two separate bat activity surveys were undertaken within the lands on 25 June 2020 by Adele Goulding Sheehan BSc (Hons), and on the 4 August 2020 by Nicholas Fettes BSc (Hons) MSc, both experienced bat surveyors of Scott Cawley Ltd. The surveys were designed with reference to methodologies in *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) (Collins, 2016), and survey details are provided in 3. Surveys involved completion of a walked transect within the proposed development site. Observations of bat activity were recorded, and where necessary, data collected in the field was analysed using specialist software (Elekon BatExplorer) to aid in the identification of bat species by their calls. Data generated from the transect surveys was analysed using Elekon BatExplorer software, whereby calls were identified to species level (where this was possible), through professional judgement and with reference *British Bat Calls: A Guide to Species Identification* (Russ, 2012¹⁰).

Date (Sunset / Sunrise)	Survey Time (Sunset)	Survey Type	Weather Conditions
25/06/2020	21:30-00:30 (21:58)	Dusk Activity Survey	Mild, wet weather with temperatures around 20°C and intermittent showers. Thunder at times.
04/08/2020	21:10-23:45 (21:16)	Dusk Activity Survey	Mostly cloudy. Dry to begin with; intermittent light to moderate rain from 22:00 onwards.

Table 6.3: Details of bat surveys undertaken within the proposed development site.

Amphibians and Reptiles

A survey for habitat suitability for amphibians and reptiles was undertaken on the 22 June 2020 by Scott Cawley Ltd. Suitable habitat for amphibians and reptiles, such as ponds and wet ditches as well as stone walls, rocks or other suitable basking features respectively (King *et al.*, 2011)¹¹, were noted and mapped. Any direct observations of individuals were noted within this assessment.

¹⁰ Russ. J. (2012) *British Bat Calls, A guide to species identification*. Pelagic Publishing.

¹¹ King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

6.2.5 Ecological Evaluation and Impact Assessment

6.2.5.1 Ecological Evaluation

Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2¹² and the guidance provided in Guidelines for Ecological Impact Assessment in the UK and Ireland¹³ – refer to Appendix 6.4 for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (Zoi) of the proposed development which are “both of sufficient value to be material in decision making and likely to be affected significantly” are deemed to be ‘Key Ecological Receptors’ (KERs). These are the ecological receptors which may be subject to significant effects from the proposed development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

6.2.5.2 Impact Assessment

Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works.
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats.
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support.

6.2.5.3 Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the proposed development are per the EPA’s Guidelines on the Information to be Contained in Environmental Impact Assessment Reports¹⁴ and CIEEM’s Guidelines for Ecological Impact Assessment in the UK and Ireland: whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and, cumulative effects.

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects: -

- Existing projects (under construction or operational).
- Projects which have been granted consent but not yet started.
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal.
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways).

¹² NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2. National Roads Authority.

¹³ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute of Ecology and Environmental Management, Winchester, UK.

¹⁴ Environmental Protection Agency. (2017) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Draft, August 2017. (refer to Table 3.3)

The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases it may not be possible to definitively conclude that an impact will not occur. In these cases the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

Significant Effects

In determining whether potential impacts will result in significant effects, the CIEEM guidelines were followed. The approach considers that significant effects will occur when there are impacts on either: -

- The structure and function (or integrity) of defined sites, habitats or ecosystems.
- The conservation status of habitats and species (including extent, abundance and distribution).

Integrity

The term “integrity” may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009).

The term “integrity” is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA / NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites’ habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

Conservation Status

Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009) guidance which are summarised as follows: -

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale.
- For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale.
- 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, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – i.e. into the future, the range, area and quality of habitats are likely to be maintained/increased and species populations are likely to be maintained/increased.

According to the CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological receptor 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). In some cases an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

6.3 Receiving Environment

6.3.1 Land Use Zoning

The subject lands are currently zoned as A2 “*new residential development*” with the zoning objective “*to provide for new residential communities with ancillary community facilities, neighbourhood facilities and employment uses as considered appropriate for the status of the centre in the Settlement Hierarchy*” within the Meath County Development Plan 2013 – 2019¹⁵.

6.3.2 Designated Sites

6.3.2.1 European Sites

Special Areas of Conservation (SAC) are designated under the EC Habitats Directive (92/43/EEC) for the protection of habitats listed on Annex I and/or species listed on Annex II of the Directive. Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC) for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

There are three European sites located within the vicinity of the proposed development. The proposed development does not overlap with any European sites. The nearest European sites are The River Boyne and Blackwater SAC and the River Boyne and Blackwater SPA, both located c. 11.5km northwest of the proposed development site. Surface waters within the proposed development site flow c. 17.9km downstream into the River Boyne and River Blackwater SPA and SAC. This European site flows downstream into the Boyne Coast Estuary SAC and the Boyne Estuary SPA in Drogheda, where waters ultimately discharge into the Irish Sea. The Rye Water Valley/Carton SAC [001398] is c. 13.5km south of the proposed site, however is not hydrologically connected to the site.

The SAC and SPA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Appendix 6.3.

The locations of those SAC and SPA sites relative to the proposed development are illustrated on Figure 6.2 below.

¹⁵ **Meath County Council (2012). *Meath County Development Plan 2013 - 2019***

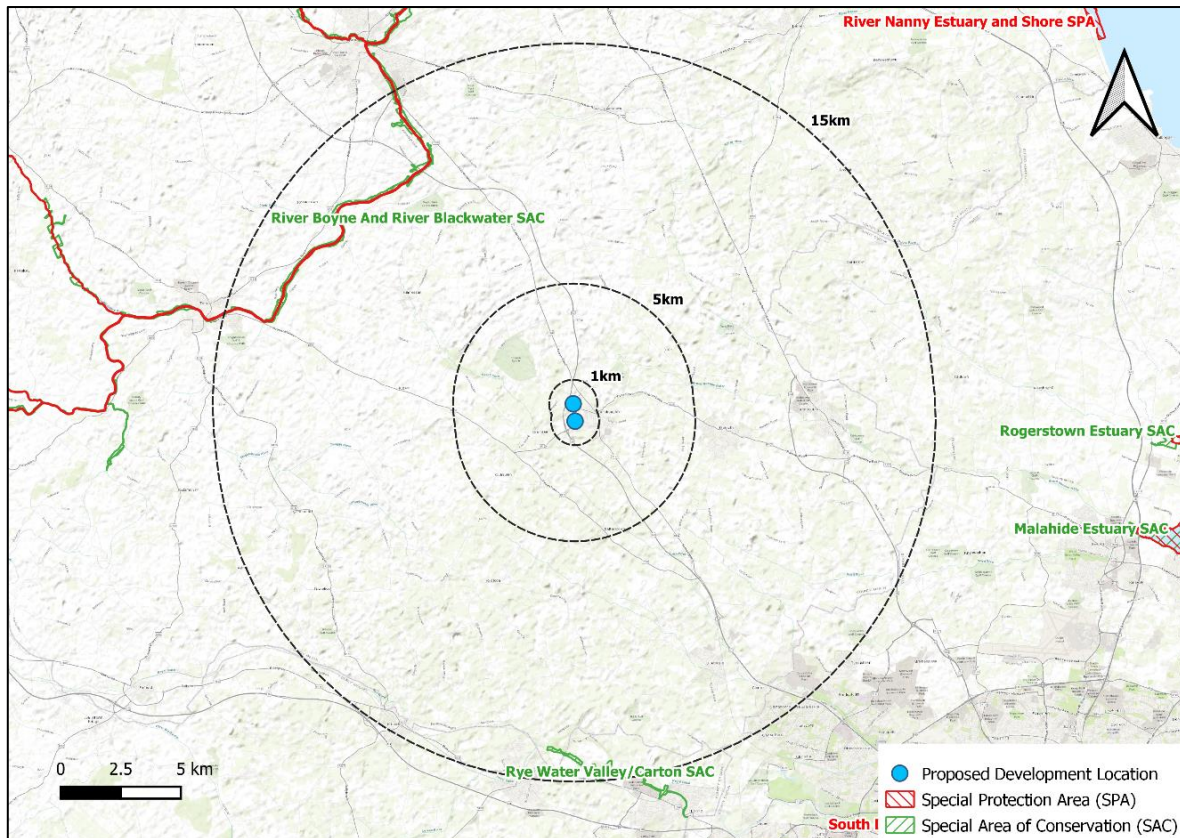


Figure 6.2: European sites in the vicinity of the proposed development.

6.3.2.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. In addition to NHAs there are proposed NHAs (referred to as pNHAs), which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. Proposed NHAs are offered protection in the interim period under county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions.

There are four nationally designated sites located within the vicinity of the proposed development, of which all are pNHAs. The proposed development does not overlap with any nationally designated sites. The closest nationally designated site is Trim pNHA, located c. 13km northwest of the proposed development. The proposed development site is not hydrologically connected to any of the four nationally designated sites, however, is located within the same groundwater body as Trim pNHA; Trim GWB.

The pNHA sites in the vicinity of the proposed development, their distance from the proposed development and their qualifying interests/special conservation interests are presented in Appendix 6.2.

The locations of the pNHAs sites relative to the proposed development are illustrated on Figure 6.3 below.

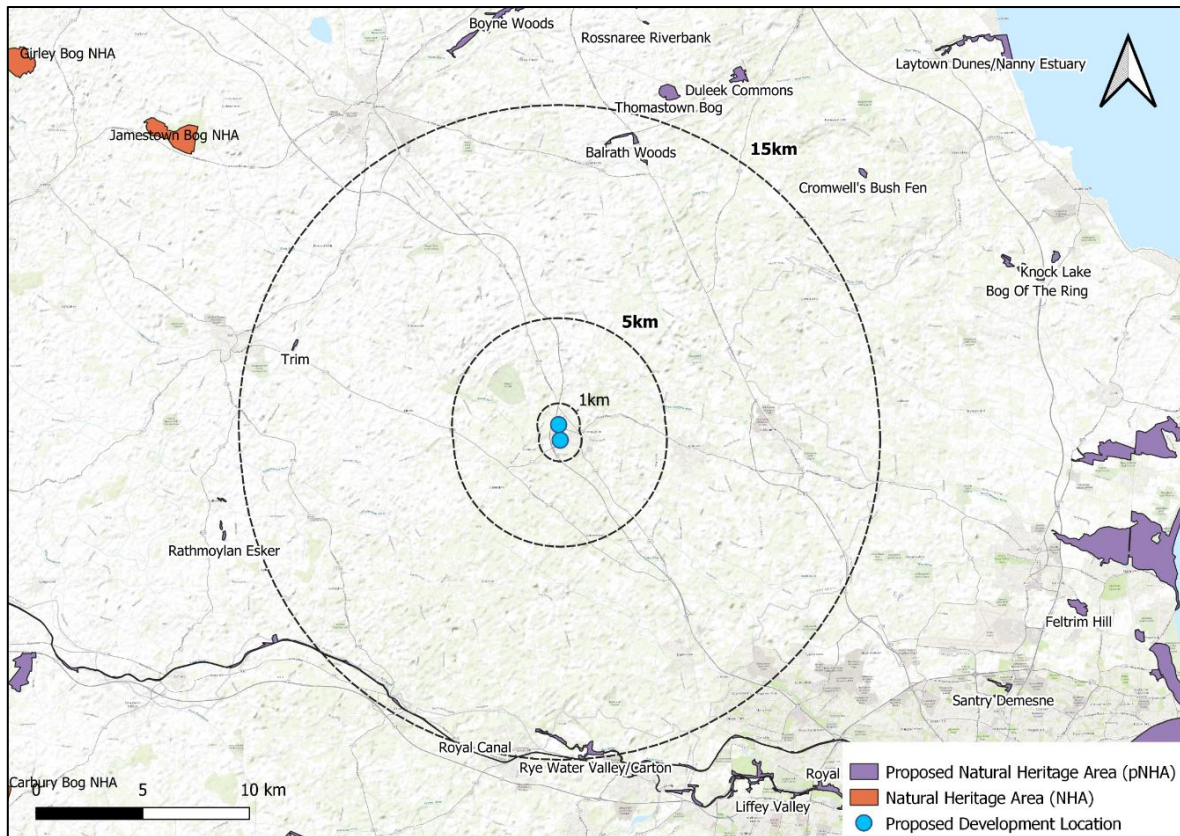


Figure 6.3: National sites in the vicinity of the proposed development.

6.3.3 Habitats and Flora

6.3.3.1 Habitats

The following habitat types (and mosaics of these), assigned using the Heritage Council classification system³, were identified within the proposed development site and are mapped in Figure 6.4. The habitats within the proposed development site include: -

- Buildings and artificial surfaces (BL3).
- Depositing/lowland rivers (FW2).
- Dry calcareous and neutral grassland (GS1).
- Dry meadows and grassy verges (GS2).
- Hedgerows (WL1).
- Immature woodland (WS2).
- Improved agricultural grassland (GA1).
- Other artificial lakes and ponds (FL8).
- Recolonising bare ground (ED3).
- Refuse and other waste (ED5).
- Spoil and bare ground (ED2).
- Treelines (WL2).

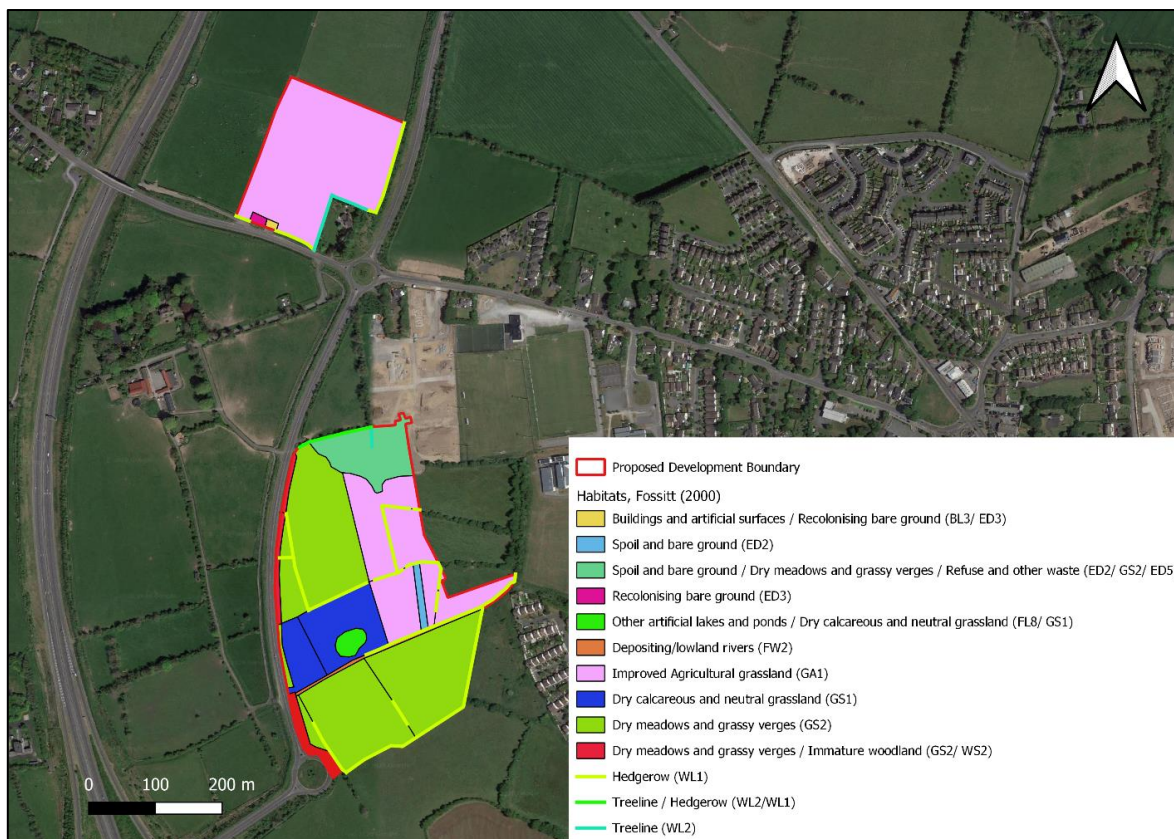


Figure 6.4: Habitat map of the proposed development site.

Habitats of Local (Lower) Ecological Value

Of the 12 habitat types recorded, six were considered to be of local (lower) ecological value due to their low diversity or managed nature. Buildings and artificial surfaces (BL3) included a hardstanding area consisting of concrete, found only in the northern field on entrance to the agricultural field. Adjacent to this area, recolonising bare ground (ED3) habitat with opportunistic plant species such as *Lolium perenne* abundant in the area, while *Matricaria discoidea*, *Capsella bursa-pastoris*, *Persicaria maculosa*, *Plantago major* and *Taraxacum officinale* all occurred occasionally through the hard standing. *Trifolium repens*, *Geranium robertianum* and *Rumex obtusifolius* were also present in very low occurrences.

Spoil and bare ground (ED2) and refuse and other waste (ED5) includes areas that have been recently cleared of vegetation and excavated with machinery, with building rubble and spoil heaps evident in the southern site in the north-eastern corner, also south of this, a large mound of soil was present between areas of agricultural grassland. Dry meadows and grassy verges (GS2) habitat occurred adjacent to the bare ground areas, and also dominates the fields in the northwest and south of the southern site (Character Area 3 & 4¹⁶). In the southern most field, bordered by hedgerows and the River Skane, the habitat was frequently under grazing pressure by cattle and horses. Common species occurring here included *Lolium perenne*, *Cynosurus cristatus*, *Ranunculus acris*, *Trifolium pratense*, *Cirsium arvense*, *Trifolium repens*, *Stellaria graminea*, *Holcus lanatus*, and *Veronica persica*. In the northern fields, *Festuca rubra*, *Ranunculus repens*, *Stellaria media*, *Cynosurus cristatus*, *Anthoxanthum odoratum*, and *Alopecurus pratensis* were also present.

¹⁶ Character Areas are described in Chapter 3: Description of Proposed Development and below in Section 6.6.

Improved agricultural grassland (GA1) identified in the northern site (Character Area 6¹⁶), where cattle frequently graze with *Lolium perenne* being the dominant species present, along with *Trifolium repens*, *Ranunculus repens*, *Holcus lanatus*, and *Poa* spp. occurring frequently within the habitat. Pockets of *Cirsium arvense*, *Alopecurus pratensis*, *Urtica dioica*, and *Taraxicum vulgaria* also occurred here. In the southern site, the eastern portion comprised of this habitat with similar species, but also included *Trifolium pratense*, *Cerastium fontanum*, and *Dactylis glomerate*. In wetter areas closer to the River Skane, *Juncus effusus* was present.

Due to the heavy grazing pressure on the majority of these habitats, lack of species diversity and frequent disturbance, these habitat types area all valued as being local importance (lower value).

Habitats of Local (Higher) Ecological Value

Depositing lowland rivers (FW2)

This lowland river habitat is the River Skane, approximately 1m in width (variable along watercourse) and c.30cm deep (by eye during site surveys), and consisted of gravel and silt substrate. The watercourse flowed through the southern section of the site (Character Area 3 & 4), bordered by hedgerows and fields grazed by cattle and horses. There was evidence of heavy poaching by cattle along the banks and through the watercourse, with vegetation overgrown and shading the water below in some areas. Little instream vegetation was present, however fringing vegetation included *Convolvulus arvensis*, *Galium aparine*, *Heracleum sphondylium*, *Filipendula ulmaria*, *Ranunculus repens*, *Rosa canina*, *Rubus fruticosus*, and *Urtica dioica*. Small fish fry were identified during field surveys within the watercourse.

Due to the connectivity and variety in habitat this watercourse provides in an area of poor quality dominated by agriculture, this habitat is considered to be of local ecological (higher value) importance.



Figure 6.5: Depositing lowland river habitat, River Skane with evidence of cattle poaching along field boundary.

Dry Calcareous and Neutral Grassland (GS1)

This habitat was found in the south of the site (Character Areas 3 & 4) in the immediate area surrounding the attenuation pond where planted (presumed from site surveys) forb species such as *Centaurea cyanus*, *Daucus carota*, *Leucanthemum vulgare*, *Rhinanthus minor*, and *Trifolium pratense* were evident. Surrounding this planted area, the habitat is within a transitional phase, likely from seeds dispersing from the assumed planted area adjacent. Forb species reduce somewhat and sward species become more dominant. Grasses, *Festuca rubra*, *Alopecurus pratensis*, *Anthoxanthum odoratum*, *Cynosurus cristatus*, *Dactylis glomerata*, *Holcus lanatus* and *Lolium perenne* are abundant. *Achillea millefolium*, *Potentilla erecta*, *Odontites vernus*, *Cerastium fontanum* and *Stellaria graminea* also occur here.

This habitat contains one 'Positive Indicator Species', *Daucus carota*, of the Annex I Grassland Habitat Semi-natural dry grasslands and scrub facies on calcareous substrates (6210)¹⁷. As this habitat only contains one positive indicator species it does not correspond to the Annex I habitat type.

This habitat also contains two 'High Quality Positive Indicator Species', *Leucanthemum vulgare* and *Rhinanthus minor*, and two 'Positive Indicator Species', *Daucus carota* and *Trifolium pratense* of the Annex I Grassland Habitat Lowland Hay Meadows (6510). As this habitat also contains a number of 'Negative Indicator Species' and is present as a result of the planted area adjacent, it does not correspond to the Annex I habitat type.

This habitat is considered to be of local ecological (higher value) importance due to its high broad-leaved species diversity and potential for progressing into a more species rich calcareous grassland habitat.

Other Artificial Lakes and Ponds (FL8)

This habitat was present as the attenuation pond in the southern site surrounded by dry calcareous and neutral grassland habitat. *Typha* spp. was identified within the pond vegetation, however a fence surrounded the pond and so a full habitat species list, and a more detailed description could not be attained.

However, due to the diversity this habitat provides in a largely agricultural environment, this habitat is valued as being of local (higher) value.

¹⁷ Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland. Accessed at: <https://www.npws.ie/sites/default/files/publications/pdf/IWM%20102%20Annex%201%20Grasslands.pdf>



Figure 6.6: Dry calcareous and neutral grassland habitat surrounding attenuation pond.

Hedgerows (WL1) / Treelines (WL2)

Hedgerows bordered the majority of the lands (Character Areas 3 & 4, and Character Area 6), and bordering fields within the lands. This habitat was also present in a mosaic with treelines along the southern most border. In the northern site, *Rubus fruticosus*, *Fraxinus excelsior*, *Crataegus monogyna*, *Corylus avellane*, *Betula pendula*, and *Sambucus nigra* were present along the southern and eastern boundary of the site. In the southern site, similar species formed the hedgerows, with the addition of *Rosa canina*, *Malus sylvestris*, and *Acer pseudoplatanus*.

As this habitat contains a mixture of native and non-native species and is well established overall, also provides connectivity to other habitats in the wider environment, this habitat is valued as being of local importance (higher value).



Figure 6.7: Hedgerows along a field boundary in the southern site.

Immature Woodland (WS2)

Roadside planting of immature woodland was present as a mosaic with dry meadows and grassy verges habitat, along the western boundary of the southern site, adjacent to the road. Immature *Corylus avellana*, *Crataegus monogyna*, *Betula pendula* and *Fraxinus excelsior* was present within this habitat as recent roadside planting.

Due to the native species present in this habitat, the connectivity it provides to other sites in the wider environment, and the change in habitat compared to the surrounding agricultural landscape, it is valued as being of a local importance (higher value).

6.3.3.2 Flora

The NBDC did not return any records for protected and/or rare plants as listed on the Flora Protection Order.

With regards to invasive non-native species, there are three records of Japanese knotweed *Reynoutria japonica* listed on Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 within c. 2km of the proposed development. Two records were from 2017 located c. 800m from the proposed development within Dunshaughlin town, and one other record was from 2013 located c. 1km from the proposed development.

No protected and/or rare species listed in the Flora Protection Order or in Red Lists, nor invasive non-native species listed on Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 were present within the proposed development site at the time of the survey.

6.3.4 Fauna

6.3.4.1 Terrestrial Fauna (Excluding Bats)

Badger

Badger *Meles meles*, and their breeding and resting places, are protected under the Wildlife Acts. The NBDC data search and NPWS identified ten records of badger within c. 2km of the site from between 2013-2016. No records are from within the proposed development boundary, with the closest being c. 300m north of the sites.

No badger setts, feeding signs or territorial markings of badger (i.e. latrines) were observed within the lands during surveys in June 2020. Suitable foraging and commuting habitat for badger was observed along the hedgerows/treelines across the lands. Notwithstanding the absence of signs of badger gathered during the site survey, and as badgers are known to be present in the wider environment, the subject lands are considered likely to be part of the wider territory of local badger populations.

In light of the above and considering the protection offered to badgers and their setts, the local badger population is valued as being of local importance (higher value).

Otter

Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. A desk study identified no records of otter within c. 2km of the proposed boundary.

No holts or sign of otter (i.e. spraint) were observed within the lands during the surveys in June 2020. The habitat along the River Skane was deemed unsuitable for holt creation, due to the soft, waterlogged ground present, but is suitable for passage of otters through the site. Otters are found to be present downstream of the River Skane from an NBDC search of records within a 10km grid square.

There is suitable habitat for otter within the proposed development site, and due to local otter populations downstream and the relatively large range of otter territories, it is therefore considered that the local otter population is of county importance, which is distinct from the River Boyne and Blackwater SAC populations.

Hedgehog / Other Small Mammals

Hedgehog *Erinaceus europaeus* is protected under the Wildlife Acts. The NBDC database search identified five records of hedgehog within c. 2km of the site.

No evidence of hedgehog or any other small mammal species were found onsite. The grassland and hedgerow/treeline habitats within the lands are suitable for use by hedgehogs for commuting and foraging, and potentially for breeding.

The small mammal populations are assessed as being of local ecological (higher value) importance.

The NBDC also identified two records of invasive mammal species on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2015 within 2km of the proposed development, Eastern grey squirrel *Sciurus carolinensis*, and American mink *Mustela vison*. No evidence of these species was found on site during surveys.

6.3.4.2 Breeding Birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive. The following bird species were observed within or in the vicinity of the proposed development: blackbird *Turdus merula*, blackcap *Sylvia atricapilla*, blue tit *Cyanistes caeruleus*, chaffinch *Fringilla coelebs*, chiffchaff *Phylloscopus collybita*, coal tit *Periparus ater*, dunnock *Prunella modularis*, goldcrest *Regulus regulus*, goldfinch *Carduelis carduelis*, great tit *Parus major*, herring gull *Larus argentatus*, hooded crow *Corvus cornix*, jackdaw *Coloeus monedula*, linnet *Linaria cannabina*, magpie *Pica pica*, mallard *Anas platyrhynchos*, mistle thrush *Turdus viscivorus*, pheasant *Phasianus colchicus*, reed bunting *Emberiza schoeniclus*, robin *Erithacus rubecula*, rook *Corvus frugilegus*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, swallow *Hirundo rustica*, wood pigeon *Columba palumbus*, and wren *Troglodytes troglodytes*. With the exception of goldcrest, herring gull, robin, linnet, starling and swallow, all of the aforementioned bird species are green-listed (i.e. of low conservation concern) in the most recent evaluation of bird populations in Ireland in Birds of Conservation Concern in Ireland (Colhoun & Cummins, 2013). Goldcrest, robin, linnet, starling and swallow are amber listed (of medium conservation concern), due to short term declines in populations on a national level. Robin in particular remains abundant and a local and national level Ireland. Herring gull is red listed (high conservation concern), due to recent population declines.

Treelines, hedgerows and dry meadows and grassy verges habitat which are found in most areas within the development, are considered to be suitable for range of nesting bird species, including those mentioned above.

As the red and amber listed bird species that have been recorded using the site are common bird species, and the protection afforded to breeding birds and their nests, the local bird populations are considered to be of local importance (higher value) for bird species.

6.3.4.3 Bats

Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the Lesser horseshoe bat also listed on Annex II) and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011. The NBDC hold records of the following bat species in the vicinity of the proposed development site: -

- Common pipistrelle *Pipistrellus pipistrellus*, 20 records from 2014 from the NBDC recorded within 2km of the site.
- Leisler's bat *Nyctalus leisleri* three records from 2013 from the NBDC recorded within 2km of the site.
- Soprano pipistrelle *Pipistrellus pygmaeus* two records from 2010 from the NBDC recorded within 2km of the site.

The habitat within the lands provides good commuting and foraging routes for bats within the area. The treelines and hedgerows along the boundary of the site follow linear routes which are connected to treelines in the surrounding area, and the subject lands are unlit by adjacent roads or buildings, and therefore are suitable for foraging bats. 30 (29 *Fraxinus excelsior* and one *Acer pseudoplatanus*) were identified to have potential to support roosting bats within the proposed development site (Figure 6.10). 28 were deemed as having low potential, with two trees deemed as having moderate potential, both assessed in accordance with Collins et. Al (2016) bat survey guidelines (Figure 6.8).

There were no buildings or structures within the proposed development site.

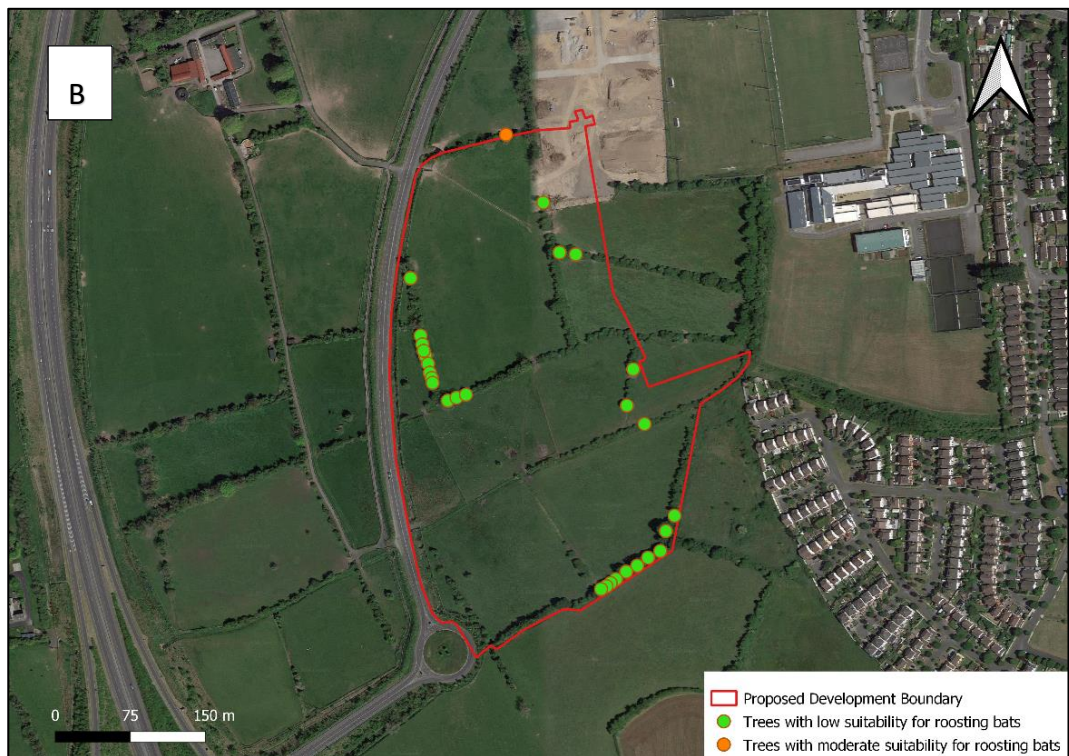


Figure 6.8: Locations of trees with bat roost potential in the northern site (A) and the southern site (B).

The bat activity surveys recorded three bat species: Common pipistrelle, Leisler's bat and soprano pipistrelle. In the northern site, all three aforementioned species were identified by call, mainly commuting along the southern boundary of the site, and also identified foraging beneath streetlights on the Drumree Road. In the southern site, Leisler's bat and common pipistrelles were identified foraging and/or commuting along most of the hedgerows within the proposed development site, with the southern-most hedgerow being identified as a foraging area for common pipistrelles.

In light of the above and given the potential bat roost features identified within trees which may also function as temporary roost sites, the proposed development site is deemed to be of moderate suitability for commuting and foraging bat species.

Given the low number of bats and the common species identified, the bat populations found using the site are valued as being of local importance (higher value).





Figure 6.9: Areas of bat activity noted within the proposed development site in the northern site (A) and the southern site (B).

6.3.4.4 Amphibians and Reptiles

The Wildlife Acts provide protection to Ireland's only reptile species, common lizard, *Zootoca vivipara* and two amphibian species, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*.

Desk study returned records for amphibians in the vicinity of the proposed development. The NBDC data search returned eight records of common frog from 2003. The attenuation pond within the southern site was not surveyed for amphibians due to access constraints, however, it has the potential to support amphibians for breeding and residing in. There was vegetation within the pond that provides shelter, and would likely support invertebrate populations. The River Skane in close proximity to this pond would allow for amphibians to commute between this site and any other suitable areas in the wider environment.

There were no records of common lizard in the NBDC database within 2km of the site. The site has small areas of bare ground fringed with grassland which may have potential to support basking reptiles. No individuals were observed at the time of the survey, and it is considered unlikely that reptiles are present within the site, as common lizard is typically associated with heath and coastal scrub habitat in Ireland.

The local amphibian population is assessed as being of local ecological (higher value) importance for amphibians. The local reptile population is assessed as being of local ecological (lower value) for reptiles.



Figure 6.10: Attenuation pond with suitable habitat for amphibian species.

6.3.4.5 Fish

The River Boyne and its tributaries form important fisheries in Ireland, and the Boyne and Blackwater SAC is designed for populations of Salmon *Salmo salar* that use these tributaries as spawning grounds. Other fish species found within the Boyne Catchment include: trout *Salmo trutta*, pike *Esox Lucius*, perch *Perca fluviatilis*, stone loach *Barbatula barbatula*, gudgeon *Gobio gobio*, minnow *Phoxinus phoxinus*, rudd *Scardinius erythrophthalmus*, bream *Abramis brama*, tench *Tinca tinca*, eel *Anguilla anguilla*, flounder *Platichthys flesus*, and river lamprey *Lampetra fluviatilis*¹⁸.

The River Skane that runs through the southern portion of the proposed development site flows into the River Boyne and Blackwater SAC and SPA c. 17.9km downstream. The portion that runs through the site is heavily poached by cattle, as noted during field surveys, with little instream vegetation and with a silty substrate. Small fish fry were noted in the stream during surveys, however due to its degraded nature and absence of a natural substrate, the River Skane watercourse which runs through the proposed development site is deemed unsuitable for Salmonid species and has limited fisheries value. The River Skane that runs through the proposed development site is valued as being of local ecological (lower value) for fish populations, however the downstream receiving environment for fish species is of national importance due to its designated status for salmonids. Therefore, the overall evaluation of the fish population is classified as being of local importance (higher value).

6.3.5 Summary of Ecological Evaluation

Table 6.4 below summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and National Roads Authority, 2009).

¹⁸ O'Grady, M.F. (1989) Rehabilitation of the Boyne. Institution of Engineers of Ireland Journal March Issue, pp. 22-24.

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
River Boyne and Blackwater SAC	International	Yes
Rye Water Valley/Carton SAC	International	No
River Boyne and Blackwater SPA	International	Yes
Trim pNHA	National	Yes
Balrath Woods pNHA	National	Yes
Royal Canal pNHA	National	Yes
Rye Water Valley/Carton pNHA	National	No
All SAC or SPA sites	International	No
All NHA or pNHA sites	National	No
Habitats		
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No
Depositing/lowland rivers (FW2)	Local importance (higher value)	Yes
Dry calcareous and neutral grassland (GS1)	Local importance (higher value)	Yes
Dry meadows and grassy verges (GS2)	Local importance (lower value)	No
Hedgerows (WL1)	Local importance (higher value)	Yes
Immature woodland (WS2)	Local importance (higher value)	Yes
Improved agricultural grassland (GA1)	Local importance (lower value)	No
Other artificial lakes and ponds (FL8)	Local importance (higher value)	Yes
Recolonising bare ground (ED3)	Local importance (lower value)	No
Refuse and other waste (ED5)	Local importance (lower value)	No
Spoil and bare ground (ED2)	Local importance (lower value)	No
Treelines (WL2)	Local importance (higher value)	Yes
Fauna Species		
Bats	Local importance (higher value)	Yes
Badgers	Local importance (higher value)	Yes
Otters	County importance	Yes
Breeding birds	Local importance (higher value)	Yes
Hedgehog and other small mammals	Local importance (higher value)	Yes
Amphibians	Local Importance (higher value)	Yes
Fish	Local – National Importance) ¹⁹	Yes
Reptiles	Local Importance (lower value)	No

Table 6.4: Summary of the ecological evaluation.

¹⁹ The River Skane within the proposed development site is valued as local (lower value) ecological value, but downstream is of a higher ecological value (National Importance)

6.4 Characteristics of the Proposed Development

6.4.1 Proposed Development

The subject site forms part of the Applicant's wider landholding of c. 18.8 Ha extending north and beyond the Drumree Road. These lands are irregularly shaped and largely comprise two distinct sites within the western part of the Dunshaughlin Local Area Plan and are bisected by Drumree Road and Dunshaughlin Link Road and comprise a total area of c. 14.8 Ha (which includes the lands zoned F1 – Open Space).

The proposed development is set out in three character areas. Character Area 6 (c. 3.75 Ha) comprises a greenfield site which lies north of Drumree Road and to the west of the Dunshaughlin Link Road. A single private dwelling adjoins the subject site along the south eastern boundary.

Character Areas 3 & 4 (c. 8.47 Ha) are generally bounded to the west by the existing Dunshaughlin Link Road, to the south and east by lands zoned for open space, to the north by Phase 1 lands (currently under construction by the Applicant) and lands identified for neighbourhood centre use.

In summary, the proposed Strategic Housing Development broadly comprises: -

- 415no. residential units (254no. houses, 55no. duplex and 106no. apartments) in buildings ranging in height from 2 to 5-storeys.
- 1no. childcare facility (c. 409 sq. m gross floor area).
- Provision of access from Drumree Road (Character Area 6) and Dunshaughlin Link Road – R125 (Character Areas 3 & 4) and provision of internal road network including pedestrian and cycle links.
- Provision of public open space including facilitation of planned pedestrian and cyclist connection along River Skane Greenway toward Dunshaughlin Town Centre.
- Provision of wastewater infrastructure including connections to main sewers on Drumree Road and to foul networks in permitted Phase 1 development and provision of SuDS infrastructure.
- All associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works.

Surface water sewers will be laid in accordance with 'Greater Dublin Regional Code of Practice for Drainage Works' and to Meath County Council's requirements for taking into charge. As required by Meath County Council policy, BDSDS and Dunshaughlin LAP 2009-2015, the subject site will be attenuated within its own boundaries and discharged to the existing surface water network, and ultimately to the River Skane. From there, surface waters will flow c. 17.9km downstream to the River Boyne which ultimately discharges to the Boyne Estuary Plume Zone coastal waterbody via the Boyne Estuary.

North Site (Character Area 6)

For this section of the site, underground attenuation tanks within the site, designed to attenuate the 1 in 100 year critical storm event, store and attenuate surface water runoff before draining by gravity pipes into existing 450mm stormwater pipe located on Drumree Road (south eastern boundary of the site). This pipeline carries surface water along the R125 and discharges into the River Skane.

South Site (Character Areas 3 & 4)

The northern portion of this site will connect at various locations into the existing surface water network throughout the site. All surface water drainage will be drained by gravity pipes into the already constructed attenuation pond (constructed during Phase I). The southern portion of this site collects surface water runoff in two underground attenuation tanks, located adjacent to the River Skane, before attenuating and discharging runoff into the River Skane.

All attenuation tanks on site will have hydrobrake manholes installed downstream of each tank as part of the works to remove suspended solids and hydrocarbons. A downstream defender unit will be installed on any networks discharging into the River Skane, mainly from the attenuation pond and from direct discharge in the lower portion of the site. This will improve the quality of the water being discharged into the existing sewer network and watercourse, by removing sediment, floatables, hydrocarbons and associated pollutants from storm water. Permeable paving and swales will also be used to filter runoff from the site.

The proposed development will result in an overall increase of 630 P.E (population equivalent) foul effluent generated from the site. This will discharge to the existing wastewater network, dependent on an upgrade to the network which will include the construction of approximately 600m of 225mm foul sewer. Foul waters will then discharge to the Dunshaughlin WWTP at Castletown, Tara for treatment. Following treatment, the effluent from Dunshaughlin drains to the River Boyne which ultimately discharges to the Boyne Estuary Plume Zone coastal waterbody via the Boyne Estuary SPA. Dunshaughlin WWTP has a Population Equivalent (P.E) of 12,000 and is operating below capacity with a remaining P.E of 5,402 in 2017 (Irish Water, 2018). The proposed residential development has a P.E. of 630 and therefore the additional loading from the proposed development will not result in the WWTP operating above capacity.

The duration of the construction activities is expected to last 24 – 36 months. There will be no piling as no basement is proposed to be included in the design. The construction activities will include the removal of small portions of hedgerows and immature trees on the western side of the southern site, and removal of trees to accommodate the proposed development, with a number of others being assessed at a later stage for their condition.

An alternative layout has also been provided by the applicant, and is also considered in this assessment, which includes a road connection between Character Areas 3 & 4.

A full project description is provided in Chapter 3: Description of Proposed Development.

6.5 Potential Impact of the Proposed Development

As per the relevant guidelines, likely significant effects have only been assessed for KERs, as listed in Table 6.4. An impact is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of a KER at a specified geographical scale. All impacts are described in the absence of mitigation.

6.5.1 Potential Impact of the Proposed Development on Designated Sites During Construction Stage

This section describes and assesses the potential for the proposed development to result in likely significant effects on European sites that lie within the Zol of the proposed development. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for cSACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Appropriate Assessment Screening Report for the proposed development that accompanies this application.

In the case of NHAs and pNHAs the assessment considers whether the integrity of any such site would be affected by the proposed development with reference to the ecological features for which the site is designated, or is proposed.

6.5.1.1 European Sites

The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the proposed development does have the potential to affect the receiving local environment. This would be facilitated through surface water run-off and drainage which may affect water quality downstream of the proposed development and, consequently, has the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects. However, considering the following, the proposed development will not have any measurable effects on water quality in the River Boyne and Blackwater SAC and SPA, Boyne Estuary Plume Zone, and Irish Sea: -

- The scale and location of the proposed development relative to the receiving surface water network.
- The significant distance between the proposed development site and the River Boyne (c. 17.9km).
- The relatively low volume of any surface water run-off or discharge events relative to the receiving surface water and marine environments.
- The level of mixing, dilution and dispersion of any surface water run-off/discharges in the receiving watercourses, River Boyne and the Irish Sea.

Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Irish Sea as a result of surface water run-off or discharges.

An accidental pollution event during construction has the potential to affect groundwater quality locally. This would be very localised and is considered not likely to result in the degradation of existing groundwater conditions.

The nearest European site, which supports groundwater dependent terrestrial habitats and species is River Boyne and River Blackwater SAC, located c. 11.2km northwest of the proposed development. It is located in the same GWB as the proposed development site (Trim GWB) but is considered to be too distant (c. 17.9km downstream) for its groundwater level or flow to be affected by proposed construction works. It is also buffered from the development by woodland, agricultural land and urban and residential development which separate the proposed development site and the European site.

The Rye Water Valley/Carton SAC located c. 13.5km south of the proposed development, is designated for groundwater dependent habitats and species. All of the qualifying interests of the Rye Water Valley/Carton SAC, including the priority Annex I habitat Petrifying springs and two species of whorl snail, are dependent upon the existing condition and functioning of the groundwater regime. Based on information published by Geological Survey Ireland (GSI) on the Dublin GWB²⁰, 'The general groundwater flow direction in this aquifer is towards the coast and also towards the River Liffey and Dublin City'. As the European site is located in a different GWB than the proposed development site, there are no potential impacts due to a lack of impact pathway.

Therefore, there is no possibility of the proposed development undermining the conservation objectives of any of the qualifying interests or special conservation interests of any European sites, either alone or in combination with any other plans or projects, as a result of hydrogeological effects.

²⁰ https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/DublinGWB.pdf

6.5.1.2 National Sites

The proposed development does not overlap with any national sites and it is not located in their immediate vicinity. The nearest national site is Trim pNHA, located c. 13km northwest of the proposed development. The proposed development does have the potential to affect the receiving aquatic environment in the immediate vicinity of the proposed development and, consequently, has the potential to affect the integrity of any nationally designated site; either alone or in combination with any other plans or project.

As the proposed development does not traverse any nationally designated sites there is no potential for habitat fragmentation or loss to occur.

The proposed development site is hydrologically connected to National sites within the hydrological ZoI downstream of the development. However, the proposed development will not have any measurable effects on water quality in the National sites downstream of the development considering the following:

- The scale and location of the proposed development relative to the receiving surface water network.
- The significant distance between the proposed development site and the pNHA sites that are designated as pNHAs for water-dependent species/habitats within the River Boyne: Boyne Woods pNHA (c. 28.8km), Crewbane Marsh pNHA (c. 38.1km), Dowth Wetland pNHA (c. 46.3km), Boyne River Islands pNHA (c. 49.6) and Boyne Coast and Estuary pNHA (c. 55.2km).
- The relatively low volume of any surface water run-off or discharge events relative to the receiving surface water and marine environments.
- The level of mixing, dilution and dispersion of any surface water run-off/discharges in the receiving watercourses, River Boyne and the Irish Sea.

The only pNHA located with the same GWB as the proposed development (Trim GWB) is Trim pNHA. However, as the site is designated for terrestrial plant species (*Trifolium fragiferum*), any groundwater impacts that may occur would not have any effect on the integrity of this site. Therefore, there is no likely significant effect on nationally designated sites from hydrological effects during construction.

6.5.2 Potential Impact of the Proposed Development on Habitats during Construction Stage

6.5.2.1 Habitat Loss

The majority of the habitats within the proposed development boundary (c. 13.7ha) are of local biodiversity importance (lower value) and predominantly comprised of improved agricultural grassland (c. 7.9ha), dry meadows and grassy verges (c. 4.9ha), artificial surfaces, spoil and bare ground and recolonising bare ground (c. 0.9ha). As these habitats are of local biodiversity importance (lower value), their loss or modification will not result in a likely significant effect on biodiversity. Construction of the proposed development will result in the loss of habitat area; totalling c. 10ha. None of the habitats directly affected by the proposed development are considered to be any greater than of local importance (higher value) for biodiversity.

The habitat types within the proposed development boundary, and the area of each, that are considered to be of a high local biodiversity value and will be directly affected are: -

- Dry calcareous and neutral grassland (GS1) loss will equate to c. 1.3ha. This area is considered relatively species rich with planted species from the attenuation pond adjacent having spread to this area and caused the transition of a species poor habitat into a species rich habitat in a local context.
- Hedgerows (WL1) and Treelines (WL2) loss will equate to c. 222.3m, with four trees within this habitat also due for removal. This habitat contains native species and provide connection corridors between the habitats found within the site.

There will be some loss of dry calcareous and neutral grassland habitat (c. 1.3 Ha) from being developed into an amenity grassland area surrounding the attenuation pond, and will likely be directly affected by construction works. However, as there are areas within the proposed development zoned as proposed areas for meadow grassland and biodiversity areas with wildflower mixes being planted²¹, this will offset the removal of the dry calcareous and neutral grassland. Therefore, this habitat loss will not result in a likely significant effect, at any geographic scale.

There will be a loss of c. 353m of hedgerow habitat, as it will be directly impacted by construction activities. The areas that will be lost are relatively small in the context of the site, with most of the habitat and connection corridors being kept intact, native hedgerows planting of c. 862m, compensatory native mixed woodland planting of c. 3711m² proposed in various areas throughout the site. Therefore, this habitat loss is not likely to result in a significant negative effect, at any geographic scale.

There will be a loss of c. 19.4m of depositing/lowland rivers (FW2) habitat (River Skane) from the implementation of a road crossing and installation of a culvert. As this is a relatively small area of habitat loss compared with the total length of the Skane that runs through the site (c. 364m), and in context of the whole River Skane watercourse (c. 17km), the impact of habitat loss is not likely to result in a significant negative effect, at any geographic scale.

6.5.2.2 Introducing or spreading non-native invasive plant species

Planting, dispersing or allowing/causing the dispersal, spread or growth of certain non-native plant species is controlled under Article 49 of the European Communities (Birds and Natural Habitats) Regulations 2011; and refers to plant or animal species listed on the Third Schedule of the those regulations. The absence of non-invasive species as listed on the Third Schedule means that there are no potential for any spread of contamination of habitats within or immediately adjacent to the site.

6.5.2.3 Habitat degradation from dust generated during construction

The proposed development has the potential to generate dust during construction works which could affect vegetation in habitat areas within and adjacent to the proposed development boundary. However, there are no European or National sites, or highly sensitive and ecologically important habitat areas within close proximity to the development, therefore this is not likely to result in a significant negative effect, at any geographic scale.

6.5.2.4 An Accidental Pollution Event during Construction or Operation Affecting Surface Water Quality in the Receiving Environment

During construction or operation, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have a significant negative impact on water quality and consequently affect aquatic and wetland habitats in the local receiving environment.

However, it is considered unlikely that a pollution event of such a magnitude would occur during construction or operation, or be any more than temporary in nature. Particularly considering the environmental protection controls that are in accordance with policies and objectives in the relevant county development plans and local area plans. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts. Consequently, detailed mitigation measures are required to further minimise the risk of the proposed development having any perceptible effect on water quality.

²¹ Proposed Strategic Housing Development at Dunshaughlin East – Phase 2, Landscape Plan, LP-01-PP. Dated 28.07.2020

Habitat degradation as a consequence of effects on surface water quality has the potential to affect the conservation status of aquatic, wetland or estuarine/marine habitats and therefore, has the potential to result in a significant negative effect at geographic scales ranging from local to international.

6.5.3 Potential Impact of the Proposed Development on Mammals (excluding Bats) during Construction Stage

6.5.3.1 Loss of Foraging Areas

No evidence of badger, otter or small mammals was noted on site; however, the habitat is suitable for badger and small mammal foraging and commuting, and there is potential for badgers to create setts within the proposed development area. During construction phase, mammal species could be impacted by the removal of foraging area and feeding resource available. However, as there were no signs of mammal species on site, and there is an abundance of alternative suitable foraging habitat locally which is likely to be sufficient to maintain the local population in the long-term.

Although the actual effect of foraging habitat loss cannot be quantified in terms of any threshold value that could be predicted, any affected badger groups or other mammals would be expected to adapt to the changed landscape. It is therefore predicted that, despite any temporary effects, the loss of foraging habitat associated with the proposed development is unlikely to affect the conservation status of the local badger population and will not result in a likely significant negative effect, at any geographic scale.

There are no otter holts or couch sites present within, or in the vicinity of, the proposed development boundary. Therefore, the proposed development will not result in the loss of any breeding or resting places and construction works will not disturb any such sites.

In the context of river systems, the Threat Response Plan Otter *Lutra lutra* 2009-2011 document (Department of the Environment, Heritage and the Gaeltacht, 2011) defines terrestrial otter habitat as a 10m zone of riparian habitat along the riverbanks. The River Skane contains c. 17km of suitable otter habitat, and as only 20m will be lost during construction, this is not considered a likely significant effect on any geographic scale.

6.5.3.2 Pollution

During construction, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have a significant negative impact on water quality in the River Skane, and consequently an impact on otter; either directly (e.g. acute or sub-lethal toxicity from pollutants) or indirectly (e.g. affecting their food supply or supporting habitats).

An accidental pollution event affecting surface water quality during construction or operation has the potential to result in a likely significant negative effect, at a county geographic scale.

However, it is considered unlikely that a pollution event of such a magnitude would occur during construction or operation, or be any more than temporary in nature. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts and detailed mitigation measures are required to further minimise the risk of the proposed development having any perceptible effect on water quality in the local area.

6.5.4 Potential Impact of the Proposed Development on Bats during Construction Stage

6.5.4.1 Effects of Habitat Loss

All bat species and their roost sites are strictly protected under both European and Irish legislation including: -

- Wildlife Act 1976 and Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000).

- Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC).
- European Communities (Birds and Natural Habitats) Regulations, 2011.

It is an offence under Section 23 of the Wildlife Acts 1976-2017 and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the European Communities (Birds and Natural Habitats) Regulations it is not necessary that the action should be deliberate for an offence to occur. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction. Under Section 54 of S.I. 477 of 2011, a derogation may be granted by the Minister where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

The proposed development will not directly, or indirectly, affect any known bat roosts. Trees on site with the potential to support roosting bat, which could be occupied at the time of site clearance, and there is therefore the potential that bats on site could be injured or killed. All the bats recorded using the site are common species in Ireland that are classified as being of "least concern" in the Ireland Red List No. 3: Terrestrial Mammals (Marnell et al., 2019). The trees within the proposed development site that have some potential for roosting bats, are not considered to be of significant in size and are unlikely to hold enough space for them to be maternity or hibernation roosts. The potential effects on bat populations arising from loss of a small roost sites are not considered to be significant, and the loss of these sites will not affect the conservation status of bats in the area. The effects of loss of these potential roost sites on bats are not considered to be significant at any geographic scale for these reasons.

The proposed development will include the removal of bat foraging habitat and, although there are no bat roosts present within the proposed development site, construction works will result in the removal of trees and hedgerows onsite.

With regards to the loss of foraging habitat, majority of the hedgerows and treelines along the boundaries and within the site are to be retained within the design of the scheme and will therefore continue to provide foraging opportunities for bats. While there will be a loss of vegetation in the western half the of site for the period of construction which could affect local insect feeding resources for bats, these effects will be temporary only. The effects of loss of foraging habitats on bats are not considered to be significant at any geographic scale for these reasons.

6.5.4.2 Effects of Disturbance and Mortality

The removal of trees onsite to facilitate the construction of the Proposed Development has the potential to result in disturbance of bats or their roosts, or in a worst-case scenario, the mortality of bats roosting in features within the trees. Disturbance/displacement effects may also arise from the introduction of artificial lighting during construction. However, the only species recorded within the proposed development site (i.e. Leisler's bat, soprano pipistrelle and common pipistrelle) are some of the least sensitive species to artificial light spill, and given the presence of artificial lighting within the immediate vicinity of the proposed development area (i.e. within existing residential dwellings along the north eastern boundary) the local bat population would be expected to be habituated to local levels of artificial light spill. It is possible that temporary lighting required during the construction stage of the proposed development may illuminate previously unlit feeding and/or commuting areas, e.g. areas away from treeline retention areas, making them unsuitable for bats. Any effects associated with artificial lighting during construction of the proposed development, is likely to be short-term (over the 2-3 year phased construction period) and confined to specific areas within the site. It is therefore predicted that, despite any short-term effects, disturbance from artificial lighting associated with construction of the proposed development is unlikely to affect the conservation status of the local bat population and will not result in a likely significant negative effect, at any geographic scale.

6.5.5 Potential Impact of the Proposed Development on Birds during Construction Stage

6.5.5.1 Effects of Mortality and Disturbance

If site clearance works were to be undertaken during the bird breeding season (March to August, inclusive) it is likely that nesting sites holding eggs or chicks will be destroyed and birds killed. Mortality of birds at the scale of the proposed development (given the relatively low area of vegetation cover that will be lost), over what is likely to be a single breeding bird season in terms of completing site clearance works, will probably have a short-term effect on local breeding bird population abundance. However, in the longer-term this would be unlikely to affect the abundance or distribution of the breeding bird species recorded in the study area nor would it be likely to affect the long-term viability of the local populations. Particularly given that the bird species recorded on the Intel site are generally common species. The landscape planting proposed as part of the design may also serve to provide additional nesting and foraging opportunities.

The noise, vibration, increased human presence and the visual deterrent of construction traffic associated with site clearance and construction will disturb breeding bird species and is likely to displace breeding birds from habitat areas adjacent to the proposed development boundary. Although it is not possible to quantify the magnitude of this potential impact (or the potential effect zone) it could potentially extend for several hundred metres from the proposed development. Given the short-term nature of the construction works (2-3 years), disturbance or displacement effects will also be over the short-term and are therefore not likely to affect the conservation status of the local breeding bird populations.

Overall, the site clearance and physical disturbance associated with the proposed development is not likely to result in long-term effects on local breeding bird populations and will not result in a likely significant negative effect, at any geographic scale.

6.5.6 Potential Impact of the Proposed Development on Amphibians during Construction Stage

6.5.6.1 Direct Mortality

The proposed development will not result in the loss of any confirmed breeding habitat for amphibians. The most suitable habitat areas with the potential to support amphibians in the vicinity of the subject lands is the attenuation pond in the southern site. Although the attenuation pond will not be removed as part of the proposed development, they may be directly affected to a minor degree during construction due to heavy plant machinery and an increase in plant traffic in the area surrounding the pond. If amphibians are present at the time construction works are being undertaken there is a risk that they could be killed or injured. The pond has not been identified as an important breeding site, however it cannot be ruled out. The potential impacts on local amphibian populations would be significant at a local level only.

6.5.6.2 Habitat Degradation

An accidental pollution event during construction or operation, of a sufficient magnitude, has the potential to affect water quality in the River Skane. This could have long-term effects on the quality of the River Skane and the local common frog population it supports and has the potential to result in a likely significant effect, at the local geographic scale.

6.5.7 Potential Impacts of the Proposed Development on Fish during Construction Stage

6.5.7.1 Habitat Loss

Within the proposed development boundary there is c. 364.4m of river channel. There will be a loss of c. 19.4m of habitat, with c. 345m being retained and maintained in its current state with some improvements made by relaxing the slopes of the banks of the River Skane slightly but keeping the route intact. This could result in small scale habitat loss small fish fry present in the watercourse, however the works proposed may be an improvement to the existing state of the watercourse which is poached heavily by cattle, and may enhance the streams quality in the long-term. The potential impacts on local fish populations would be significant at a local level only.

6.5.7.2 Pollution

An accidental pollution event during construction or operation, of a sufficient magnitude, has the potential to affect water quality in the River Skane, either alone or cumulatively with other pressures on water quality within the catchments. This could have long-term effects on the quality of the receiving local river systems and the populations of fish species they support and has the potential to result in a likely significant effect, at the county geographic scale. However, given the scale of the works, the use of the attenuation pond attenuating surface water from the site, the distance from the proposed development to the River Boyne, and the relatively short duration of construction, there is no potential for any significant pollution event flowing downstream to the River Boyne.

6.5.7.3 Habitat Severance / Barrier Effect

There is potential for habitat severance/barrier effect to occur along the River Skane during implementation of a road crossing and installation of a culvert within the watercourse. Fish could be temporarily prevented from passing through the habitat and reaching other areas of the River Skane. However, due to the temporary nature of the works, and the improvements that the works will have on the water and habitat quality of the watercourse which will improve fish passage through the site, the impact on local fish populations would be significant at a local level only.

6.5.8 Alternative Layout During Construction Phase

An alternative layout has been provided by the applicant which diverges slightly from the preferred site layout, by the omission of a road connection between Character Areas 3 & 4. The alternative layout during construction phase is not predicted to result in any changes to the predicted effects as described above.

6.5.9 Potential Impacts of the Proposed Development on Habitats during Operational Stage

No operational phase impacts are predicted on habitats as a result of the proposed development.

6.5.10 Potential Impacts of the Proposed Development on Mammals during Operational Stage

6.5.10.1 Effects of Loss of Foraging / Commuting Areas

The proposed development is retaining the majority of hedgerows and treelines within the site, however the increase in human presence and traffic, may impact how mammal species use the area, and they may choose to avoid the area completely during operation. This will result in a loss of foraging and commuting areas for these species, however due to the abundance of suitable habitat surrounding the lands, it does not have the potential to result in a likely significant effect, at any geographic scale.

6.5.11 Potential Impacts of the Proposed Development on Bats during Operational Stage

6.5.11.1 Effects of Lighting

Bats are considered to be light-sensitive species, and increased illumination of a site can affect how bats may utilise a site (ILP, 2018). For roosting bats, increased light levels can affect predation, as avian predators tend to rely on vision to catch their prey, and increased light levels at night-time may increase bats vulnerability to predation. Illumination of foraging and commuting habitat can result of abandonment of habitat. The response to lighting in Ireland by foraging bats varies by species, with Leisler's Bat, a high-flying species, as well as Common Pipistrelle Bat and Soprano Pipistrelle Bat appearing to be least affected by lighting (Roche et al., 2014).

The habitat within the subject lands were unlit during the survey in July and August 2020, however, the R125 road along the eastern boundary of the northern site, and along the western boundary of the southern site was illuminated with streetlights, and bats were observed foraging beneath these lights. During its operation, and in the absence of any mitigation, it is anticipated that the proposed development will result in an increase in lighting of the site. Light spill will originate both from installation of public lighting in the residential areas, as well as from the residential properties themselves (e.g. incidental light pollution from house windows). The cumulative increase in light spill will be minor, as the development site suffers from light spill from the adjacent public road and adjoining properties.

6.5.12 Potential Impacts of the Proposed Development on Birds during Operational Stage

6.5.12.1 Disturbance

It is possible that birds using the site and environs may be temporarily disturbed as a result of increased noise and human activity levels during operation of the proposed development. This could potentially result in the temporary disturbance and displacement of birds until they habituate to the increased levels of noise and human activity. Birds recorded within the subject lands are typical garden and sub-urban species which are considered to tolerate increased levels of disturbance providing suitable habitat remains which birds use as a refuge. Overall, the disturbance during operation is unlikely to have any long-term population level effects on bird species, and therefore, unlikely to result in a significant effect at any geographic scale.

6.5.13 Alternative Layout during Operational Stage

The inclusion of an alternative layout as provided by the applicant which diverges slightly from the preferred site layout, by the omission of a road connecting Character Areas 3 & 4. The alternative layout during operational phase may include an increase in artificial lighting, which has the potential to impact bat species commuting and foraging in the area. However, this impact is not predicted to have any more of an impact on bat species in the area as already discussed in section 6.5.11.1 with the original layout. Therefore, the impact of the alternative layout is not predicted to result in a likely significant effect, at any geographic scale.

6.5.14 Do-Nothing Impact

Under the do-nothing scenario, the site would continue to be used as agricultural lands for grazing cattle. The calcareous and neutral grassland might become more species diverse and widespread or, equally as likely, agricultural intensification may result in a decrease in species diversity associated with grassland habitats on the site. The areas of spoil and recolonising bare ground may be proliferated by opportunistic plant species and are likely to become rank grassland in the absence of any grassland management. The habitat would continue to offer suitable habitat for roosting, commuting and foraging bats, nesting habitat for birds, commuting and foraging habitat for mammals, and habitat within the attenuation pond for amphibians. Characteristics of the site would, therefore, not change drastically, and it would continue to support similar habitats and fauna.

6.5.15 Cumulative

This section of the report presents the assessment carried out to examine whether any other proposed developments have the potential to act cumulatively with the proposed development to give rise to likely significant effects on biodiversity.

There are granted planning permissions for residential or other small-scale developments such as construction of housing developments, retail units, car parking spaces, etc. in the immediate vicinity of the proposed development site as well as larger scale developments in close proximity to the proposed development site, some of which may be in construction at the same time as the proposed development. A list of these projects considered in the cumulative impacts assessment has been included in Appendix 6.5.

Potential cumulative impacts may arise during construction and operation, as a consequence of the proposed development acting in-combination with other plans and projects, on water quality in the downstream surface water environment, disturbance to birds, bats, small mammals and badger, as well as habitat loss to bats, birds, small mammals, otters and badger.

There is potential for cumulative impacts to arise with other local developments that would also result in increased noise, vibration, human presence and lighting. However, as any disturbance effects from other such local developments are likely to be of a minor nature, temporary, localised and over a short-duration, they are not likely to cumulatively affect the local badger, small mammal, breeding bird, otter or bat populations in conjunction with the proposed development.

The most likely cumulative effect of other future development with the proposed development on the receiving environment is the potential for other pollution sources within the River Boyne catchment, to cumulatively affect water quality in the receiving surface water, estuarine and marine environments. There will be no significant cumulative impacts on water quality in the downstream surface water environment in the River Boyne or the Boyne Estuary, as a consequence of the proposed development acting in-combination with other plans and projects, with the mitigation measures outlined in Section 6.8, which will be implemented in full, proposed measures will ensure that surface water and groundwater quality in the local groundwater body is protected during construction and operation of the proposed development.

However, any long-term effects on biodiversity are likely to be moderated by the environmental protective policies and objectives of the Meath County Development Plan 2013-2019, and the Dunshaughlin LAP 2013 - 2019.

There are general overarching policies in the Meath County Development Plan 2013-2019 to ensure that proposals for development integrate the protection and enhancement of biodiversity (Policy NH 1) and to identify and protect sites of local biodiversity importance (Policy NH 2). There are also specific objectives to protect European sites (Policy NH 5), prevent development that would adversely affect the integrity of any European site(s) or National site(s) (Policy NH 6), to ensure that development does not have significant impact on protected habitats and species (Policies NH 8, 9), to encourage the retention of hedgerows and prevent the loss and fragmentation (Policy NH 13), and to promote and encourage planting of native hedgerow species (Policy NH 14). The Meath County Development Plan 2013-2019 also has specific policies and objectives relating to the protection of surface water and groundwater resources (e.g. WS Policy 2, WS 17, WS 18, WS 19, WS 20, WS 24).

The environmental protective policies and objectives set out in the Meath County Development Plan 2013-2019 are mirrored in the Dunshaughlin Local Area Plan 2013-2019 in terms of the protection of protection of hedgerows, planting of native hedgerows, and prevention of loss of fragmentation (Policy NH 3, 4, 5, 7). The LAP also has specific policies and objectives relating to the protection of surface water and groundwater resources (Objective WWT 1, and Objective SWM 1, 2).

Considering the predicted impacts associated with the proposed development, the mitigation measures proposed to protect the local biodiversity resource and the receiving environment, and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

6.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

This section presents the mitigation measures that will be implemented during construction and operation to avoid the potential impacts of the proposed development on KERs as outlined above. All of the mitigation measures will be implemented in full. They are in accordance with best practice, and tried and tested, effective control measures to protect the receiving environment.

6.6.1 Mitigation measures for Designated sites during Construction Stage

6.6.1.1 European Sites

As set out in the Appropriate Assessment Screening Report, in concluding that the proposed development is not likely to have a significant effect on any European sites, mitigation measures intended to avoid or reduce any harmful effects of the proposed development on European sites were not required or taken into account.

6.6.1.2 National Sites

As there is no risk of the proposed development to affect the integrity of any nationally designated site, mitigation measures intended to avoid or reduce any harmful effects of the proposed development on nationally designated sites were not required or taken into account.

6.6.2 Mitigation for Habitats during Construction Stage

6.6.2.1 Retention and Protection of Vegetation during Construction

Any vegetation (including trees, hedgerows or scrub adjacent to, or within, the proposed development boundary) which is to be retained shall be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows: -

- All trees along the proposed development boundary that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged.

6.6.2.2 Protection of Vegetation from Dust during Construction

To control dust emissions during construction works standard mitigation measures shall include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds and speed restrictions (20 km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.

Dust screens will be implemented at locations where there is the potential for air quality impacts on sensitive ecological receptors (i.e. within 100m of the works) such as the attenuation pond, during the construction phase.

6.6.2.3 Measures to Protect Surface Water Quality during Construction

Mitigation measures to protect surface water in the receiving environment during construction are detailed in EIAR *Chapter 8 Water*, and in the Outline Construction Management Plan (CMP), and include: -

- Management and control of surface water run-off.
- On-site attenuation tanks.
- Fuel, chemical and hazardous material storage and handling.
- Emergency response to accidental spillages.
- Monitoring and maintenance of the waste water treatment systems.
- Testing and inspection of onsite sewers and new sewer connections and procedures to isolate, contain and dispose of and leakage from the foul sewer.
- Foul sewers surveyed by CCTV and assessed to identify possible physical defects. Any defects will be remediated and re-CCTV'd to verify that the works have been completed in accordance with the specifications.

6.6.3 Mitigation for Mammal Species (excluding Bats) during Construction Stage

6.6.3.1 Measures to Protect Badgers During Construction

The mitigation measures described below follow the recommendations set out in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006). These guidelines set out the best practice approach in considering and mitigating impacts on Badgers during construction works.

As there are badger records from the local area, and badger could potentially establish new setts in the future within the ZOI of the proposed development, a pre-construction check of all suitable habitat within the proposed development boundary will be required within 12 months of any constructions works commencing. Any new badger setts present will be afforded protection in line with the requirements set out in the TII/NRA guidance document as follows: -

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage.
- No heavy machinery shall be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances.
- During the breeding season (December to June inclusive), none of the above works shall be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts.
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a badger ecologist.

As the proposed development will not result in the permanent loss of any badger setts, there is no requirement to construct any artificial setts as part of the mitigation strategy.

6.6.3.2 Mitigation for Bat Species during Construction Stage Measures to Protect Bats during Vegetation Clearance

The following mitigation measures are proposed in relation to those trees and trees groups identified as having high potential to support roosting bats (Figure 6.10). Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by the proposed felling works. The following mitigation procedures will be followed: -

- Felling of confirmed and potential tree roosts will be undertaken during the periods April – May or September – October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist
- Trees should only be felled “in section” where the sections can be rigged to avoid sudden movements or jarring of the sections
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture
- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

6.6.3.3 Measures to Control and Reduce Light Spill During Construction and Operation

Any light spill affecting bat use of habitats outside of the proposed development boundary will be avoided, where feasible. Light levels during construction and operation in these areas will be kept to a minimum where feasible.

This will be achieved through sensitive siting and design of the lighting elements. This will include careful consideration of light placement on buildings, column heights and luminaire design. Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light to where it is needed. Ideally luminaires should be selected which do not emit UV light (e.g. metal halide and fluorescent light sources should be avoided). LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.

Monitoring of light levels along the hedgerows and treelines areas will be undertaken pre-construction, during-construction and post-construction to identify any areas where light spill is affecting background levels during construction or operation.

Where monitoring detects light spill is affecting these habitat areas, remedial measures will be implemented to ensure that minimum light levels are maintained. Following a review of the lighting design, these measures may include modification of lighting locations and column heights, luminaire design and/or introducing additional screening to reduce light spill.

Reporting on the monitoring will be forwarded to the local authority for their review and any remediation required agreed between them and the applicant.

6.6.4 Mitigation for Birds during Construction Stage

Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

6.6.5 Mitigation for Amphibians during Construction Stage

If works to clear any of the habitat features suitable to support amphibian species are to begin during the season where frogspawn or tadpoles may be present (February – mid-summer), or where breeding adult newts, their eggs or larvae may be present (mid-March – September), a pre-construction survey will be undertaken to determine whether breeding amphibians are present.

In the case of common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat.

In the case of smooth newt, individuals will be captured and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the Zol of the proposed road development. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth nest.

If the size or depth of the habitat feature is such that it cannot be determined whether all amphibians have been captured, it will be drained under the supervision of a suitably experienced ecologist to confirm that no amphibian species remain before it is destroyed or infilled. Any mechanical pumps used to drain the habitat feature will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism.

Any capture and translocation works shall be undertaken immediately in advance of site clearance/construction works commencing.

6.6.6 Mitigation to protect Fish during Construction Stage

6.6.6.1 Habitat Loss

To minimise the effects of habitat loss on fish species, all sections of river/stream channel within the proposed development boundary, but not within the footprint of the proposed development and associated infrastructure, will be protected from site clearance and construction works. Rivers/streams will be fenced off at a minimum distance of 5m from the river bank where any works are taking place nearby and within this zone the natural riparian vegetation will be retained where possible.

6.6.6.2 Mortality Risk & Disturbance/Displacement during Construction

To minimise the potential effects of construction works on fish species the following mitigation measures will be implemented: -

- No instream works will be carried out between the months of October and June (inclusive) to avoid the most sensitive time for fish species and fish species movements.
- Design of new sections of river channel shall be in accordance with the principles outlined in Channels & Challenges. Enhancing Salmonid Rivers (O'Grady, 2006).
- Immediately prior to rivers/streams being diverted into a newly constructed river channel or culvert, they will be electrofished (if required) to capture and transfer fish from the original channel to the new one. Once the watercourse has been diverted this will be followed by a manual search of the original watercourse to transfer any remaining fish to the new river/stream channel.
- Any water abstraction points required for dust suppression will be agreed with IFI and the suction head shall be screened to ensure that fish are not removed during the abstraction process.

6.6.6.3 Habitat Severance / Barrier Effect during Construction

All temporary crossing structures used to cross watercourses during construction will be designed in accordance with the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016) and Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (National Roads Authority, 2005) to maintain fish and macroinvertebrate passage, and to prevent sedimentation and erosion.

6.6.7 Mitigation for Habitats during Operational Stage

6.6.7.1 Measures to Protect Surface Water Quality during Operation

Mitigation measures to protect surface water in the receiving local environment in the River Skane during operation are detailed in Chapter 8: Water, and in the Outline Construction Management Plan (CMP), and include: -

- Continued management, monitoring and maintenance of the waste water treatment systems in accordance with the EPA licence requirements.
- Runoff from the site will be attenuated within the on-site attenuation tanks, and hydrobrakes and downstream defender will also be employed to control the rate of discharge. In combination these SuDS measures significantly reduce the volume and rate of surface water discharging from the site.
- The SuDS treatment train will pre-treat the surface water discharging to the River Skane, removing pollutants and hydrocarbons from the surface water runoff.

These mitigation measures are for the protection of the water quality within the River Skane watercourse only, and not for the protection of European Sites downstream as there are no significant effects likely to arise on European sites as a result of water quality impacts associated with the proposed development, as discussed above in Section 6.5.1.

6.6.8 Mitigation for bats during operational stage

In order to provide additional roosting opportunities for bats, the installation of bat boxes will be erected on suitable retained trees in suitable locations across the site, the location of which to be decided by a suitably qualified and experienced bat ecologist.

6.6.9 Mitigation for other mammal species during operational stage

Mitigation measures are not required as no operational phase impacts are predicted on badger or small mammal species as a result of the proposed development.

6.6.10 Mitigation for birds during operational stage

Mitigation measures are not required as operational phase impacts predicted on bird species as a result of the proposed development will be short-term and not significant.

6.6.11 Mitigation for amphibians during operational stage

Mitigation measures are not required as no operational phase impacts are predicted on amphibians as a result of the proposed development.

6.7 Residual Impact of the Proposed Development

6.7.1 Designated Sites

6.7.1.1 European Sites

The assessment presented in the Appropriate Assessment Screening Report concluded that there was no risk of the proposed development resulting in a likely significant effect on any European site, either alone or in combination with other plans or projects. Therefore, the proposed development is not likely to have significant residual effects on any European sites.

6.7.1.2 Nationally Designated Sites

There is no risk of the proposed development to affect the integrity of any nationally designated site, either alone or in combination with other plans or projects. Therefore, the proposed development is not likely to have significant residual effects on any nationally designated sites.

6.7.2 Habitats

Residual effects on habitats and flora will be reduced to non-significant levels following the implementation of the measures outlined in Section 6.6.2.

6.7.3 Bats

Significant effects in the absence of mitigation have been identified in relation to loss of potential roosting and foraging habitats for bats, and disturbance and/or mortality of bats during construction. Measures to avoid, reduce and mitigate effects on bats have been provided in Section 6.6.3.2 of this Chapter. Following the implementation of these measures, residual effects on bats arising from the proposed development will be reduced to levels not considered to be significant.

6.7.4 Mammals

The effects of the proposed development on mammals have been considered within Section 6.5.3 of this Chapter. Measures to avoid, reduce and mitigate effects on mammals have been provided in Section 6.6.3 of this Chapter. Following the implementation of these measures, residual effects on breeding birds arising from the proposed development will be reduced to levels not considered to be significant.

6.7.5 Breeding Birds

The effects of the proposed development on breeding birds have been considered within Section 6.5.12 of this Chapter. Measures to avoid, reduce and mitigate effects on breeding birds have been provided in Section 6.6.4 of this Chapter. Following the implementation of these measures, residual effects on breeding birds arising from the proposed development will be reduced to levels not considered to be significant.

6.7.6 Amphibians

The effects of the proposed development on amphibians have been considered within Section 6.5.6 of this report. Measures to avoid, reduce and mitigate effects on amphibians have been provided in Section 6.6.5 of this Chapter. Following the implementation of these measures, residual effects on amphibians arising from the proposed development will be reduced to levels not considered to be significant.

6.7.7 Fish

The effects of the proposed development on fish have been considered within Section 6.5.7 of this Chapter. Measures to avoid, reduce and mitigate effects on fish have been provided in Section 6.6.6 of this Chapter. Following the implementation of these measures, residual effects on fish arising from the proposed development will be reduced to levels not considered to be significant.

6.8 Monitoring

This heading is not considered relevant to this chapter

6.9 Reinstatement

This heading is not considered relevant to this Chapter.

6.10 Conclusions

The proposed development²² does not pose a risk of adversely affecting (either directly or indirectly) the integrity of any European site, either alone or in combination with any other plans or projects.

The proposed development does not have the potential to result in significant negative effects on nationally designated areas for nature conservation, either alone or cumulatively with any other plans or projects.

The proposed development has the potential to affect the surface water quality and the ecology of the adjacent waterbodies in the local area.

The alternative layout proposed has the potential to increase lighting in the area during operational phase and subsequently may impact local bat species, however this is not predicted to impact bat species any more than the original layout would.

There will be no works (e.g. piling/blasting) which may affect groundwater and groundwater dependent terrestrial habitats of European sites.

The proposed development will result in some habitat loss within the proposed development boundary, but this will not result in any significant negative effects. The landscape design will ensure that the biodiversity value of the habitats to be retained and created as part of the proposed development are maximised.

²² In referring to the proposed development, this includes the proposed alternative layout which includes the omission of a road connecting Character Areas 3 & 4.

The proposed development has the potential to affect habitats indirectly as a result of air quality and surface water quality. It also has the potential to result in significant negative effects on otters at a county level, and fish at a local level.

The proposed development does not have the potential to result in significant negative effects on badgers, breeding birds, amphibians, small mammals and bats at a local or any other geographic level.

With the implementation of the mitigation measures associated with the proposed development (in Section 6.8), in conjunction with the protective policies at plan level (as discussed in Section 6.7.13), there is no potential for other projects to act cumulatively with the proposed development to result in likely significant biodiversity effects.

A comprehensive suite of mitigation measures is proposed, in addition to the extensive and stringent environmental control measures that have been incorporated into the design of the proposed development. All of the mitigation measures will be implemented in full and are best practice, tried and tested, and effective control measures to protect biodiversity and the receiving environment. It is recommended that all mitigation measures included within this report are committed to and delivered through the planning conditions.

Considering the elements included within the design of the proposed development (as described in Section 6.6), and the implementation of the mitigation measures proposed in Section 6.8 to avoid or minimise the effects of the proposed development on the receiving ecological environment, no significant residual ecological effects are predicted.

The residual effects associated with the proposed development are in compliance with the protective biodiversity and natural heritage policies set out in the *Meath County Dev. Plan 2013-2019*, the *Dunshaughlin LAP 2013 – 2019* and the *County Meath Biodiversity Action Plan 2015-2020*.

6.11 Difficulties Encountered

Habitat and flora surveys were undertaken in July 2020. This is within the optimal survey period for a range of flora. In light of the narrow range and type of habitats within the lands, the timing of surveys is not considered to pose any significant limitations on the survey results.

With regard to fauna surveys, the timing of the surveys was not within the optimal survey period for mammals and amphibians. Mammal surveys, such as badger surveys, are typically carried out during winter months due to better visibility associated with plant senescence. Dense vegetation may affect the surveyor's ability to find entrances to for example badger setts and holts, and these may be missed even when reasonable effort is applied into finding them. The aforementioned factors are not considered to pose any limitation on the ecological assessment of the proposed development due to the lack of dense vegetation within the proposed development site.

Common frog surveys are typically carried out in February and March and include searches for their spawn, whereas smooth newt surveys include specialist surveys involving trapping and/or night-time torching of suitable waterbodies between March and June. However, as the only suitable habitat area (the attenuation pond) for amphibians is being retained, this is not considered to pose any significant limitations on the ecological assessment of the subject lands.

The attenuation pond in the southern site had a fence surrounding it when site surveys were undertaken in June 2020, and so a full flora and faunal assessment could not be completed. However, as the attenuation pond is being retained, this is not considered to pose any significant limitations on the ecological assessment of the subject lands.

All breeding bird survey visits were carried out in late-June 2020. They are typically spread across the months between April and June inclusive to capture both early and late breeding bird species. It was not possible to complete early breeding bird visits due to the government Covid-19 restrictions which were in place in April and May 2020. The timing of the surveys is not considered to pose any significant limitations on the ecological assessment of the subject lands, as birds recorded in June are those likely to be present across the breeding season considering the range any types of habitats present on, and in the vicinity of, the proposed development site.

