November 2023

Ecological Impact Assessment

Large Scale Residential Development at Broomfield West, Midleton, Co. Cork

On behalf of

Castle Rock Homes Midleton Ltd.

MALONE O'REGAN ENVIRONMENTAL

QUALITY
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Ecological Impact Assessment

Large Scale Residential Development at Broomfield West, Midleton, Co. Cork

Castle Rock Homes Midleton Ltd.

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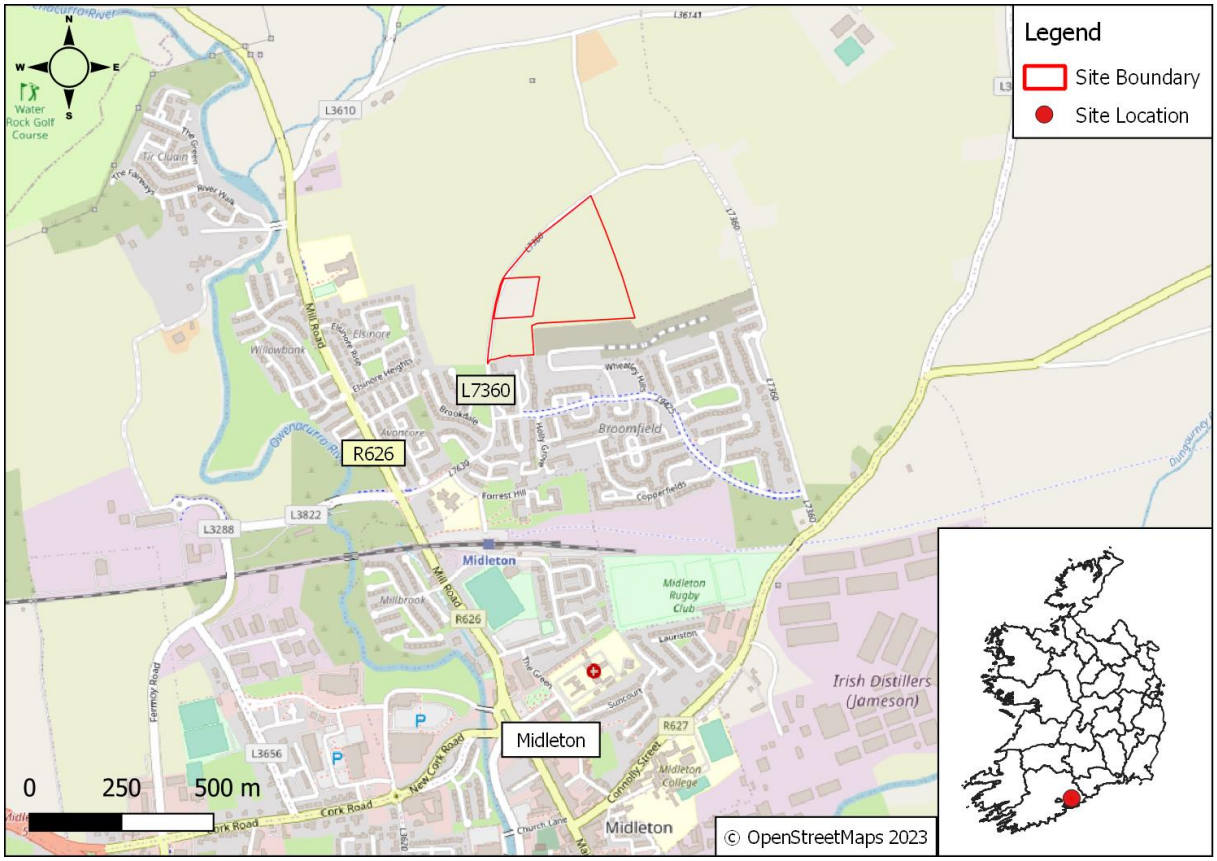
1 INTRODUCTION

1.1 Background and Purpose of Report

Malone O'Regan Environmental (MOR) were commissioned by Castle Rock Homes (Midleton) Ltd. ('the Applicant') to undertake an Ecological Impact Assessment (EcIA) to assess the potential ecological impacts, if any, of both the construction and operational phased of the proposed Larger Residential Development (LRD) Housing Application ('the Proposed Development)

The Proposed Development, consisting of 272No. units (houses and apartments) and a childcare and community use facility, will be located on a site that is ca. 8.273 hectares (ha) in size and is located within the townland of Broomfield West, Co. Cork, ca. 1km north of Midleton town centre (OS ITM Reference 588097 575082). The location of the Site is shown in Figure 1-1.

Figure 1-1: Site Location



The objective of this EcIA was to survey and assess the land within and adjacent to the Site for the presence of any habitats or species that could present a constraint or an opportunity for enhancement due to the Proposed Development and assess the potential impact of the Proposed Development on identified ecological receptors.

This report will be submitted as part of a planning application for the Proposed Development to Cork County Council. An Appropriate Assessment – Stage 1 Screening Report (AA)will also be submitted in support of the planning application.

1.2 Statement of Authority

This report was reviewed and approved by Ms Kathryn Broderick, Principal Ecologist. Kathryn is a full member of the Chartered Institute of Ecology and Environmental Management

(CIEEM). Kathryn has 7 years' experience working in the ecological consultancy sector, including habitat surveys and appraisals and specialist protected species surveys in support of Appropriate Assessments.

1.3 Legislation and Planning Policy Context

1.3.1 Legislation Policy Context

Within Ireland, a number of sites of international or national importance to nature conservation, as well as many species of animal and plants are afforded a degree of legal protection, as set out in Box 1 below.

A study of biodiversity related planning policy at both national and local level has been undertaken for the Site and locality in order to highlight any potential conflicts with the relevant legislation and guidance documents.

Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species

The National Parks and Wildlife Service (NPWS) notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation (SACs) and Candidate Special Area of Conservation (cSACs): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Birds and Natural Habitats) Regulations 2011-2021.
- Special Protection Areas (SPAs) and candidate Special Protected Areas (cSPAs): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (209/147/EC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention, to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- Natural Heritage Areas (NHAs): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas (pNHAs): these sites are not afforded the same protection as NHAs. These sites are proposed by the NPWS but are not statutorily proposed or designated. Prior to statutory designation these are subject to a very limited legal protection. They are, however, sites of significance for wildlife and habitats and are important for the purposes of this EcIA report.

Legally protected species

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora Protection Order 2022 (S.I.No.235/2022).

Other notable habitat/species categories

- Biodiversity Action Plan (BAP) species: those targeted in local or national BAPs as being of particular conservation concern (priority species);
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland on the Birds of Conservation Concern in Ireland 2020-2026 [1]; and,
- Other Irish Red Data Book [2] species and Nationally/Regionally/Locally Notable species where appropriate.

1.3.2 National Planning Context

1.3.2.1 Planning Policy Statement

Project Ireland 2040 was launched by the Government in February 2018 [3] and incorporates two policy documents - the National Planning Framework and the National Development Plan.

National Planning Framework

Under the biodiversity section "*Project Ireland 2040 National Planning Framework*", the National Policy Objective 59 is to:

'Enhance the conservation status and improve the management of protected areas and protected species by:

- *Implementing relevant EU Directives to protect Ireland's environment and wildlife;*
- *Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;*
- *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites; and,*
- *Continued research, survey programmes and monitoring of habitats and species.'*

The National Policy Objective 60 in the same document is to:

> *'Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance.'*

The National Development Plan

The National Development Plan [4] also lists the following items as strategic investment priorities in relation to National Heritage and biodiversity:

- *'Implementation of the current and future National Biodiversity Action Plan, delivery of National Parks and Wildlife Service Farm Plans and LIFE projects, enhanced wildlife crime investigation capacity and identification and delivery conservation measures at designated sites as identified in the Prioritised Action Framework for Ireland (2021-2027).'*
- *'Investment in nature and biodiversity, to improve the quality of natural habitats and support native plants and animals, including those under threat, and to bolster broader societal wellness and sustainability goals.'*
- *'Future-proofing obligations under the Biodiversity Strategy 2030, including potential national designations and the preparation and delivery of a National Restoration Plan.'*

1.3.2.2 Ireland's National Biodiversity Action Plan.

The 3rd National Biodiversity Action Plan (NBAP) sets out a number of strategic objectives that lay out a clear framework for Irelands approach to biodiversity and demonstrates Ireland's commitment to protect our biodiversity and also halt decline [5]. This NBAP will remain in place until the new NBAP 2023-2027 is published, please see Section 1.3.2.3 below for further details. The following objective within the current NBAP was considered relevant to the Proposed Development and this report:

Objective 4 of the NBAP aims to:

> '*Conserve and restore biodiversity and ecosystem service in the wider countryside.'*

1.3.2.3 Ireland's Draft National Biodiversity Plan, 2023 – 2027:

Ireland's 4th NBAP has been in development since 2021 and was put forward for public consultation in September 2022. Submissions were closed on the 9th of November 2022 and, at the time of writing this report, this consultation was under review. The draft NBAP was reviewed as part of this report and a number of objectives were considered relevant to the Proposed Development [6].

Objective 2 of the draft NBAP aims to:

'Meet urgent conservation and restoration needs.'

A number of targeted outcomes are listed under this objective which are considered relevant to the Proposed Development. These include the following:

Outcome 2A:

'*The protection of existing designated areas and species is strengthened and conservation and restoration within the existing protected are network are enhanced'.*

Outcome 2B:

'Biodiversity and ecosystem services in the wider countryside are conserved.'

Outcome 2C:

'All freshwater bodies are of at least, 'Good Ecological Status' as defined under EU Water Framework Directive.'

Outcome 2G:

'Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment.'

Under Objective 3, the following targeted outcome is considered relevant to the Proposed Development:

Outcome 3A:

'Ireland's natural heritage and biocultural diversity is recognised, valued, enhanced and promoted in policy and practice.'

1.3.3 Regional Planning Context

The Regional Spatial and Economic Strategy for the Southern Region (RSES) [7] recognises the need to conserve and enhance biodiversity through co-ordinated spatial planning between the counties within the southern region of Ireland. This strategy came into effect on 31st January 2020.

Under the biodiversity section, Regional Policy Objective 126 states that the Southern Regional Assembly will:

a) *'Promote biodiversity protection and habitat connectivity both within protected areas and in the landscape through promoting the integration of green infrastructure and ecosystem services, including landscape, heritage, biodiversity and management of invasive and alien species in the preparation of statutory and non-statutory land-use plans. The RSES recognises the role of the National Biodiversity Data Centre through its Citizen Science initiatives;*

b) *Support local authorities acting together with relevant stakeholders in implementing measures designed to identify, conserve and enhance the biodiversity of the Region; seek and support the implementation of the All-Ireland Pollinator Plan, National Biodiversity Action Plan and National Raised Bog SAC Management Plan;*

c) *Local Authorities are required to carry out required screening of proposed projects and any draft land-use plan or amendment/ variation to any such plan for any potential ecological impact on areas designated or proposed for inclusion as Natura 2000/ European Sites and shall decide if an Appropriate Assessment is necessary, of the potential impacts of the project or plan on the conservation objectives of any Natura 2000/European Site;*

d) Support local authorities to carry out, monitor and review biodiversity plans throughout the Region. Planning authorities should set objectives in their land use plans to implement and monitor the actions as set out in the National and County Biodiversity Plans, as the conservation of biodiversity is an essential component of sustainable development. Local authorities should address the issue of fisheries protection and invasive introduced species and encourage the use of native species for landscape planting in rural areas, in the review of their biodiversity plans;

e) Support local authorities to work with all stakeholders to conserve, manage and where possible enhance the Regions natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the Region.'

The RSES also contains policies relating to invasive species. Regional Policy Objective 127 states that it is an objective to:

a) 'Support coordination between the Region's local authorities in terms of their measures to survey invasive species in their counties and coordinate regional responses;

b) Encourage greater awareness of potential threats caused by invasive species and how they are spread;

c) Carefully consider and implement the management of invasive species where there is a corridor, such as hydrological connections to European Sites in order to prevent the spread of invasive to sensitive sites.'

1.3.4 Local Planning Context

1.3.4.1 Cork County Development Plan 2022 - 2028

Cork County Development Plan 2022 - 2028 (CCDP) contains a number of objectives that relate directly to the protection of biodiversity and natural heritage in the context of development [8]. These include objectives that involve compliance with the EU Habitats Directives and the Irish Wildlife Acts and that ensure the protection of ecological corridors and habitats [8].

The objectives of the CCDP with regards to the natural environment that are relevant to the Proposed Development are as follows:

Objective BE 15-1: Support and comply with national biodiversity protection policies

a. Support and comply with the objectives of the National Biodiversity Plan 2017-2021 (and any future National Biodiversity Plan which may be adopted during the period of this Plan) as appropriate.

b. Implement the current County Biodiversity Action Plan and any future updated Plan.

c. Support and comply with biodiversity policy set out in other national and regional documents as appropriate.

Objective BE 15-2: Protect sites, habitats and species.

a. Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan.

b. Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan.

c. Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan.

d. Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development.

e. Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.

Objective 15-6: Biodiversity and New Development

'Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by:

a. Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice.

b. Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments.

c. Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new development.

d. Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate.

e. Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats.

f. Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity – supporting the principle of biodiversity net gain.

Objective BE 15-7: Control of invasive Alien Species

'Implement best practice to minimise the risk of spread of invasive alien species, on Council owned or managed land, and require the development and implementation of Invasive Alien Species Management Plans for new developments where required.'

Objective BE 15-8: Trees and Woodlands

a. Protect tree the subject of Tree Preservation Orders

b. Make use of Tree Preservation Orders to protect important trees or groups of trees which may be at risk or any tree(s) that warrants an order given its important amenity or historic value

c. Encourage the provision of trees for urban shading and cooling in developments in urban environments and as an integral part of the public realm.

d. Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting.

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2 METHODOLOGY

2.1 Assessment Methodology for Prediction of Effects

Desk study data collection and field survey work were carried out as part of the EcIA process, with the objective of ensuring that sufficient data was collected to identify the designated sites, habitat areas and species that could be significantly affected by the Proposed Development. This information then informed the assessment of effects on the potential biodiversity receptors.

The area for which biological data was collected was based on an assessment of the ecological zone of influence of the Proposed Development. The ecological zone of influence is the area that could be affected by the Proposed Development, within which there is the potential for significant ecological effects. All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [9], few projects have a Zone of Influence this large, however the identification of European sites within 15km and NHAs and pNHAs within 5km has become widely accepted as the starting point. For this reason, all SPAs and SACs in 15km and NHAs and pNHAs in 5km have been identified for consideration. Desk study data were collected for this area (See Section 4.1), whilst field surveys focused on the lands within and adjacent to the Site (See Section 4.2).

It should be noted that there was the potential for the Zone of Influence to be redefined during the assessment process in response to new design or environmental information, and / or for the geographical extent of field surveys to be extended to cover a greater extent of the desk study area (e.g., if the desk study identified species occurring offsite that could be significantly affected by the Proposed Development). In the end, such an increase in the study area was not required for this assessment.

The next stage of the assessment was to determine which, if any, of the sites, habitats and species within the Zone of Influence (referred to in this report as 'potential biodiversity receptors') had the potential to be significantly affected by the Proposed Development (see Section 5). A high level 'scoping' assessment was then undertaken (see Section 5.1) to differentiate effects that were sufficiently likely to be significant as to merit more detailed assessment, from those that could be assessed at a less detailed level as they were classified as not likely to be significant (referred to as 'scoped-out' effects).

The assessment of how the potential biodiversity receptors would likely be affected by the environmental changes associated with the Proposed Development was based not only on the results of the desk study and field surveys, but also on published information on the potential biodiversity receptors' status, distribution, sensitivity to these changes, biology, and knowledge of ecological processes and functions, as appropriate.

2.2 Desk Study

A desk-based review of information sources was completed, which included the following sources of information:

- Review of aerial maps of the Site and surrounding area;
- The National Parks and Wildlife Service (NPWS) website was consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment [10];
- The Cork County Council Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [11];

- The Department of Housing, Local Government and Heritage's planning portal – the National Planning Application Database to obtain details about existing / proposed developments in the vicinity of the Site [12];
- The National Biodiversity Data Centre (NBDC) website was consulted with regard to species distributions [13]; and,
- The EPA Maps website was consulted to obtain details about watercourses in the vicinity of the Site [14].

2.3 Field Survey

2.3.1 Habitat Survey

A habitat survey of the Site was undertaken on the 4th of April 2023 by two (2No.) suitably qualified and experienced MOR Ecologists. The survey was undertaken for the Site with the Heritage Councils – '*A Guide to Habitats in Ireland'* [15] and '*Best Practice Guidance for Habitat Survey & Mapping*' [16]. This is the standard habitat classification system used in Ireland and includes both a desk based and field-based assessment.

The assessment was extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation.

Following the completion of the habitat survey, it was deemed necessary to undertake additional specialist surveys for breeding birds, please see details below.

2.3.2 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitat types of present indicated could occur onsite.

Flora

The Site was assessed for the presence of notable / protected flora species in accordance with the following:

- Flora (Protection) Order 2022 (S.I. No. 235/2022); and,
- Ireland Red List No. 10: Vascular Plants [17].

Badgers

A badger habitat suitability assessment was also undertaken during the habitat survey for the Site and the surrounding lands. The survey aimed to identify and examine areas where badgers might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Badger Scat (isolated badger droppings);
- Latrines (shallow pits/holes occurring together comprised of exposed badger droppings); and,
- Badger setts.

A mammal path was assumed to be used by badgers if the character of the path (in terms of size) was appropriate and / or if any other signs were in close vicinity (e.g., a badger sett).

The field survey of the Site was conducted in line with the following relevant guidance for badger:

- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [18];
- The Mammal Society, 'Surveying Badgers,' [19]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [20].

Bats

An assessment of the suitability of the habitats within and bordering the Site to support bat roosting, foraging, and commuting was carried out.

The trees were inspected in accordance with the NRA 'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes' [21]. The following criteria were used to assess the mature trees onsite:

- Presence of natural cavities, splits, cracks, loose bark and rot holes in the trunk or boughs of the tree;
- Presence of dense and woody ivy (*Hedera helix*) growth that could be used by bats for roosting;
- Evidence of bat droppings, which may also be seen as a black streak beneath holes, cracks, branches, etc;
- Presence of smooth edges with dark marks and urine stains at potential entrances to roosts;
- Adjoining habitat which are likely to be important to bats, including the river corridor, and hedge / treelines within the survey area that offer a variety of potential foraging, roosting and commuting opportunities for bats; and,
- Adjoining potential roosts / known roosts identified. This raises the likelihood of a tree being of benefit as bats may move roosts if the roost becomes too hot or cold during roosting and a nearby alternative roost is highly desirable.

Birds

The Site was assessed for its potential to support important assemblages of birds of rare or notable species. Surveys aimed to identify and examine areas where wintering and breeding birds might occur. Any activity and potential nesting habitats onsite were noted.

Wintering Birds

Two (2No.) wintering bird surveys were undertaken by one (1No.) suitably qualified and experienced MOR ecologist. The first was conducted on the 22nd of March 2023, and the second was conducted on the 27th of March 2023. The date, time and weather conditions of each survey is described in Table 2-1.

Table 2-1: Winter Bird Survey Metadata

Date	Temperature (°C) (Start – End)	Wind (Beaufort Wind Scale)	Rain	Cloud Cover
27/02/2023	7-9°C	1	No rain	100%
22/03/2023	7°C	2	Showers	0-100%

These surveys were conducted in adherence with the Winter Farmland Bird Survey methodology provided by the British Trust for Ornithology (BTO) [22] and, the Wintering and Migratory Wildfowl (especially geese and swans) survey methodology provided by the Scottish Natural Heritage (SNH) [23].

The surveys were timed to coincide with the high tide in Cork Harbour, or as close to high tide as possible in suitable weather conditions and during daylight hours, in order to ascertain whether or not wetland bird species utilising the nearby SPA utilise the proposed site for foraging or roosting purposes when favourable habitats (such as mudflats) are inaccessible.

All of the field boundaries located within the proposed site boundary were walked, and all of the open areas were observed for the presence of birds. Where a large number of birds feeding was encountered long stops were taken in order to ensure accurate species recording and counting. All birds were recorded using a standard BTO code through sight and sound and optical equipment, such as binoculars, was used to minimise disturbance to wintering birds. The behaviours and activities of the birds were recorded to identify whether the birds were roosting or feeding within the Site. Any roosts identified within the proposed site were recorded. All waterbird / designated bird species flying over the proposed site and the direction in which they were flying were recorded by the surveyors; however, all other bird species flying over the proposed site were not recorded unless the birds were clearly associated with the Site, i.e., had been flushed out.

The locations of all birds were recorded on an overview map of the proposed site, and the zone in which the birds were located was noted. The zone represents where they were first recorded and are described as follows:

- Boundary – birds located within or adjacent to treelines, hedgerows or other boundary structures;
- Margin – birds located within the outer 20m of fields; and,
- Interior – birds located within the field beyond the margin zone.

Breeding Birds

Breeding bird transect surveys were undertaken on the 14th of April 2023 and the 9th of May 2023 by suitably qualified MOR ecologists. The breeding bird survey was conducted in line with the methodology described in:

- BTO – *A Field Guide to Monitoring Nests* [24]; and,
- Common Bird Census in Bird Monitoring Methods [25].

In order to establish whether any breeding bird species were utilising the habitats onsite or the airspace above the Site, the Common Bird Census (CBC) methodology was implemented. The transect survey was designed to cover all accessible habitat within and adjacent to the Site.

All birds were recorded through sight and sound. Optical equipment was used, including binoculars, in order to minimise disturbance to potentially breeding birds. Suitable vegetation onsite was examined for the presence of nests. During the survey, the behavioural activity of the recorded birds was noted using the BTO breeding status codes [2]. Birds that displayed non-territorial behaviours were recorded as well (i.e., birds that were flying over the Site, birds that were foraging and not calling, birds that were loafing).

Therefore, birds were classified as non-breeding, possibly breeding and confirmed breeding based on the behaviours exhibited. The criteria for each classification are described below:

- Non-breeding – Birds that were flying over the Site, birds that were foraging and not calling, birds that were loafing;

- Possible Breeding – Birds observed in suitable nesting habitat and displaying either territorial and / or courtship behaviours, nest building behaviours or observed visiting a possible nest; and,
- Confirmed Breeding – Birds observed either on nest or carrying faecal sac or food, sighting of a nest with eggs / chicks, used nests, eggshells or recently fledged young.

The metadata for the breeding bird survey are described in Table 2-2.

Table 2-2: Bird Survey Metadata

Date	Time	Temperature (°C) (Start – End)	Wind (Beaufort Wind Scale)	Rain	Cloud Cover
14/04/23	06:35 – 08:00	5°C - 6°C	2	No Rain	50%
09/05/23	07:20 – 08:40	11°C - 11°C	2	No Rain	80%
08/06/23	06:35 – 07:33	14°C - 16°C	4	No Rain	20%
27/07/23	07:20 – 08:30	16°C - 17°C	3	No Rain	100%

Hedgehogs and Pygmy Shrews

The habitats within the Site were appraised for their potential to support hedgehogs (*Erinaceus europaeus)* and pygmy shrews (*Sorex minutus)* in line with the NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [18].

Invasive species

The Site was visually assessed for the presence of any noxious / invasive species that are regulated under Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) [26] such as Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*).

The Site was also assessed for the presence of non-regulated invasive species that have the potential to impact local biodiversity.

Other Species

In addition, an assessment was carried out of the potential for the Site to support any other species considered to be of value for biodiversity including those that were identified as occurring locally based on the findings of the desktop study and professional judgment.

2.3.3 Survey Limitations

Please note, the start of the wintering bird season (October – January) was not covered by the surveys due to the project planning stage initiating in February 2023.

No other survey limitations were encountered.

2.4 Assessment Methodology

The current Guidelines for Ecological Impact Assessment in the UK and Ireland [27] recognise that an ecological assessment cannot consider in detail every individual species or habitat that may potentially be affected by a proposed development.

The EcIA process aims to identify those ecological receptors that could be significantly affected by the proposed development i.e., where the effects on the receptor are of sufficient concern that they could influence the planning decision) or for which the development could result in the breach of relevant legislation.

The effects of the proposed development on these receptors are then assessed, taking into account the sensitive design measures (avoidance measures) and where necessary the mitigation measures incorporated as part of the proposed development. The scope of the EcIA is determined iteratively.

2.4.1 Significance Evaluation Methodology

As part of the high-level assessment reported in Section 4.1, the conclusion about whether effects are sufficiently likely to be significant as to merit more detailed assessment is informed by a judgement about whether:

- The site, habitat or species population is of sufficient quality or size that an effect upon it could be significant; and,
- The environmental changes associated with the development are such that there is the potential for a significant effect to occur (i.e., for the integrity of a site or for the conservation status of a habitat area or species population to be affected).

If the answer to both of these questions is yes, the relevant receptor would be subject to more detailed assessment and the significance of effects would be evaluated based on the methodology that is outlined below.

2.4.1.1 Negative Effects

For biodiversity receptors, an effect is assessed as being significant if the favourable conservation status of the specified biodiversity receptor is compromised by the proposed development. Conservation status is defined by CIEEM (2016) as follows:

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

The decision as to whether the conservation status of the specified biodiversity receptor has been compromised has been made using professional judgement, drawing upon the results of the assessment of how each receptor will be affected by the proposed development.

A similar procedure has been used for designated sites that are affected by the proposed development, except that the focus is on the effects on the integrity of each site, defined as "the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and / or the levels of populations of the species for which it was designated."

2.4.1.2 Positive Effects

A positive effect is assessed as being 'significant' if development activities are predicted to cause:

- An improvement in the condition of a habitat / species population from unfavourable to favourable – condition data are only available for some Natura sites, but professional judgement and a review of available literature has been used to apply the same principle to habitats / species elsewhere; or,
- Partial or total restoration of a site's favourable condition.

If a species population, habitat or site is already in favourable condition, it is still possible for there to be a significant positive effect. There is however no simple formula for determining when such effects are significant, given the complexities of assessing these types of effects.

In such cases, decisions about significance have therefore been made on a case-by-case basis.

2.5 Identification of Potential Biodiversity Receptors

The assessment of the ecological Zone of Influence of the Proposed Development concluded that the development would be likely to result in changes in the extent and / or condition of the existing land cover onsite, with potential effects on habitats and species onsite. There is also the potential for effects on any areas that adjoin the Site, where fauna might make use of the land cover onsite.

In summary, therefore, the ecological Zone of Influence of the Proposed Development is defined as:

- The Site of the Proposed Development (fauna and flora); and,
- Habitats adjoining the Site (fauna).

In the case of designated sites, a precautionary approach has been taken and the search area extended to identify sites outside of the zone of ecological influence. This information was used to further inform the assessment process and to ensure that the onsite habitats are not of importance for either habitats or species for which these sites have been designated.

As a basis for determining which biodiversity receptors need to be assessed within the Zone of Influence of the development, CIEEM's guidelines on EcIA recommend that consideration be given to the biodiversity conservation value of the sites, habitats and species that occur within the zone (as appropriate). The guidelines also refer to the need to consider the legal status that is afforded to some species and habitats (See Box 1).

Legal status needs to be considered because all developments must comply with the requirements of the law. By implication, therefore, there cannot be significant effects as a result of non-compliance with the law. However, it should be noted that, notwithstanding legal requirements, there is the potential for some legally protected species to be significantly affected in relation to their biodiversity conservation value.

In relation to biodiversity conservation value, only those designated sites, habitat types and species that fall within one or more of the categories defined in Box 1 are of sufficient importance that they could be significantly affected by the Proposed Development.

Drawing upon the biological data assembled for the purposes of this EcIA (Section 4), the potential receptors in relation to the Proposed Development are discussed in Section 5.1.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Existing Environment

The Proposed Development is located on a ca. 8.273 hectares (ha) site within the townland of Broomfield West, Midleton, Co. Cork. The Site is located ca. 1.3km northeast of Midleton town centre and approximately 23km to the east of Cork City Centre.

The Site is predominately comprised of agricultural lands and is bordered by existing residential developments to the south, and further agricultural lands to north, east and west. Midleton Water Treatment Plant interjects into the western boundary and the L7360 provides the curved western boundary of the Site. There are also residential developments currently under construction to the northeast of the Site, and on the opposite side of the L7360, to west of the Site as shown in Figure 3-1. The L7630 provides the curved western boundary of the Site.

The Site is accessed via Broomfield Road, L7360 on the western boundary via 2 no. access points.

Figure 3-1: Site Context

3.2 Watercourses within the Vicinity of the Site

The Site is located within the Lee, Cork Harbour and Youghal Bay catchment [Catchment_ID: 19] and the Owenacurra_SC_010 subcatchment [Subcatchment_ID: 19_13] [28].

As per EPA maps, there is one (1No.) hydrological feature of note within close proximity to the Site. No hydrological features were identified onsite.

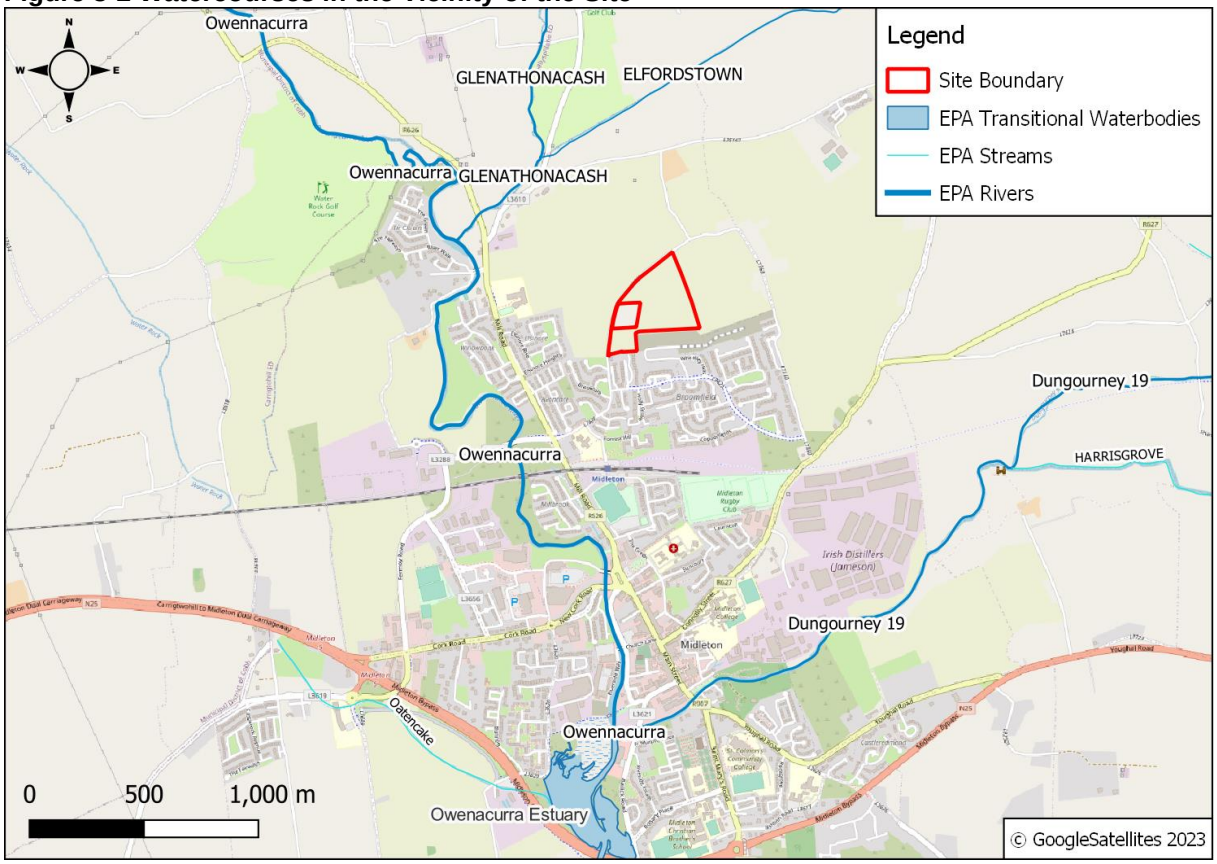
1. The Owenacurra River

This river is located ca. 475m to the southwest of the Site, at its closest point. The river flows in a southerly direction, and drains into the Owenacurra Estuary, ca. 930m downstream of the Site. The Owenacurra Estuary flows in a south-westerly direction for ca. 2.4km before discharging into the North Channel and Great Island Estuary. The North Channel and Great Island Estuary continues for a further 3.7km before discharging into Cork Harbour.

Under the Water Framework Directive (WFD) 2000/60/EC, the EPA classifies the status and risk of not achieving a good water quality status for all waterbodies in Ireland. According to the WFD Status 2016-2021, the most up-to-date data at the time of writing this report, the Owenacurra River, Owenacurra Estuary, the North Channel and Great Island Estuary and Cork Harbour, all have a '*moderate'* water quality status, and are considered to be '*at risk'* [28].

The location of the key surface water features in the vicinity of the Site are illustrated in Figure 3-2 below.

Figure 3-2 Watercourses in the Vicinity of the Site



3.2.1 Drainage Ditch Network

The Site walkover did not identify any drainage ditches, or any other surface water features onsite. Therefore, no natural or existing hydrological link to the Owenacurra Estuary or any other watercourse in the surrounding area was identified. As per EPA Flood Maps, the Site is not benefitted by any arterial drainage scheme or drainage district.

3.3 Description of the Proposed Development

The proposed development consists of 272No. units comprising of:

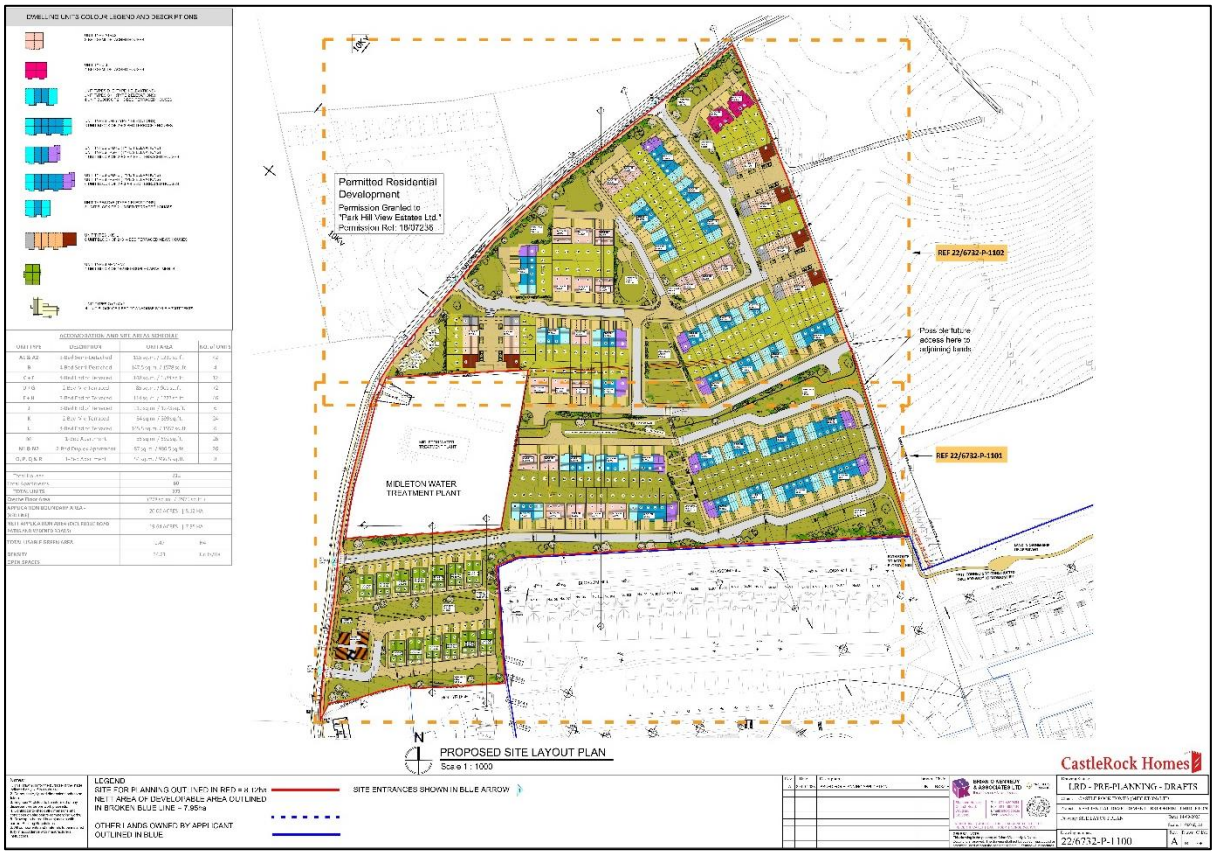
- 34No. 1-bedroom units;

- 122No 2-bedroom units;
- 94No. 3-bedroom units; and
- 22No. 4-bedroom units.

A mix of house types will be provided consisting of duplex style apartments, terraced and semi-detached units.

The proposed development also consists of a child creche and community use facility, and all associated site development works at Broomfield West, Midleton, Co. Cork.

Figure 3-3: Proposed Development Site Layout



The Proposed Development also provides for good pedestrian connection to the town centre, existing estates (Blossom Hill and Avoncore Place) to the south and future development on adjacent lands with the provision in pathways and cycle lanes throughout the site. The connection ensures good permeability for pedestrians and cyclists.

3.3.1 Drainage

Surface Water System

The surface water sewer system serving the development will consist of a network of surface water drains operated by gravity flow. The sewers will discharge westward towards the existing L-7360 public roadway. This roadway is currently being upgraded as part of the Park Hill View Estate Ltd development to the west of this roadway (PP Ref:18/7236). The public road upgrade includes installing a new surface water sewer to serve the Park Hill View Estate Ltd housing development site. The surface water sewers serving the subject proposed development will connect into this newly-laid storm sewer. These sewers have been increased in size to accommodate the proposed extra discharge from the subject development.

SuDS measures have been incorporated on the surface water system to intercept water at source and reduce the run-off from the site. A series of attenuation tanks will be installed to limit the runoff from the site to the original greenfield run off level. See Drawings 22/6372-P-1321 + 1322 for layout of SuDS measures incorporated into the development as submitted as part of the Proposed Development.

A network of gravity sewers will be installed to service the Proposed Development. Surface water will be collected from all hardstanding and impermeable surfaces. The piping network will be appropriately designed using SuDS drainage software design to accommodate the discharge volumes.

Please refer to the Engineering Report for full details on the surface water system prepared by Brian O Kennedy & Associates Ltd. which has been submitted as part of this application.

Receiving Network

The surface water outfall pipe from the development will connect to an existing manhole at the junction of the L-7360 and the Broomfield Court spine road. This manhole is part of an existing surface water network which runs from this connection point through the existing Brookdale and Avoncore estates, crossing the R626 public roadway and discharging into the Owenacurra River.

An assessment of the capacity of the receiving network has been made. Catchment areas for the network have been calculated and sizes and invert levels of the pipes have been assessed. Contributing volumes from existing properties, public roads, the under-construction Park Hill View Estate Ltd Development and the Midleton Water Treatment Plant discharge volumes have been taken into account in these calculations. The receiving network has appropriate capacity to accept the additional surface water discharge from the proposed development. These capacity calculations are attached in Appendix 'C' of the Engineering Report prepared by BOK.

Attenuation details

Underground Storage Tanks are favoured over proprietary cellular structures on account of the high soil infiltration levels and down-slope existing housing development and infrastructure. On account of the topography and the location of the Midleton Water Treatment Plant, the surface water network serving the Site is divided up into separate segments with three separate attenuation tanks provided for adequate protection against downstream river flooding. The tanks will be constructed of reinforced concrete cast in situ and fully sealed.
The surface water drainage network is shown on Drawings 22/6372-P-1303 +,1321 + 1322 and details of the attenuation tank design is shown on Drawings 22/6372-P-1323 as submitted as part of the overall planning application.

Foul Sewer System

The foul sewer system serving the Proposed Development will operate by gravity flow. The sewers will discharge westward towards the existing: -73160 public roadway. At the time of writing this report, this roadway is currently being upgraded as part of the Park Hill View Estate Ltd development (Planning Ref: 18/7236) to the west of this road. This road upgrade includes installing new surface and foul water sewers to serve the Park Hill View Estate Ltd development site. It is proposed to connect into these newly-laid sewers. These sewers have been upgraded to accommodate the proposed extra discharge from the Proposed Development. Please see Drawings 22/6372-P-1301 + 1302 submitted as part of the overall planning application.

Please note all sewers will be designed and installed in accordance with Irish Water Code of Practice infrastructure Rev July 2020.

Please refer to the Engineering Infrastructure Report for full details on the foul water sewer design and details prepared by Brian O Kennedy & Associates Ltd. which has been submitted as part of this application.

3.3.2 Water Supply

Pre-Connection query

A pre-connection query was lodged with Irish Water. The Irish Water response confirms that a water connection is feasible without infrastructure upgrade by them. The requirement to potentially divert the 12" Ductile Iron watermain is noted on the Irish Watermain is noted on the Irish Water Response. A copy of this response has been included in the Engineering Report prepared by BOK.

Proposed Network

Irish water have an existing 12" Ductile Iron watermain running through the south-west corner of the Site. It will be necessary to relocate this main to suit the proposed arrangement of roads and houses on the Site, subject to an agreement with Irish Water.

The proposed water supply network will be an internal watermain network of 150mm diameter spine with 100mm diameter branch mains. All watermain installations details will be in accordance with Irish Water – Water Infrastructure Standard Details – July 2020.

Fire hydrants will be installed such that all dwellings are within 45m of a hydrant.

A bulk water meter will also be installed at the principal watermain connection location. All dwellings will also have individual meters. Details of the water supply network are shown on Drawings 22/6372-P-1331 +1332 submitted as part of the overall planning application.

Please refer to the Engineering Infrastructure Report for full details on the water supply design and details prepared by Brian O Kennedy & Associates Ltd. which has been submitted as part of this application.

3.4 Site Access

Existing access to the subject site can currently only be achieved via L-7630 Broomfield Road which runs along the north-western boundary of the site and connects to the R626 via Avoncore Place. The site is currently used as agricultural land and generates limited if any vehicle trips on a daily basis.

3.5 Earthworks

Earthworks will include the excavation of level platforms and foundations for each residential building and the importation of stone material for access roads etc. The design of road levels and finished floor levels has been carried out in such a way as to minimize cut/fill type earthworks operations.

3.6 Landscaping

Landscaping drawings have been prepared by Forest Bird Design and will be submitted as part of this application.

3.7 Construction Procedures

During the construction phase, the methods of working will comply with all relevant legislation and best practice guidelines in reducing the environmental adverse effects of the works. Although construction phase adverse effects are generally of a short-term duration and are localised in nature, the adverse effects will be reduced as far as practicable through compliance with current construction industry guidelines.

A Construction Environmental Management Plan (CEMP) will be prepared by the appointed contractor and will be submitted to the planning authority in advance of works commencing at the Site. The following guidance will be referred to and will be followed during the construction phase of the Proposed Development to prevent water pollution that may occur within the area:

- C532 – Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors [29]; and,
- C741 - Environmental Good Practice on Site (4th edition) [30];

The proposed works will aim to be completed in approximately 36 months from the grant of planning conditions. Working hours will generally be restricted to between 08.00 – 18.00 hours Monday to Friday inclusive and between 08:00-17.00 hours on Saturdays. Construction work will not be permitted on Sundays, public holidays or at night-time except where safety concerns necessitate it or if agreed in advance with the Planning Authority.

3.8 Monitoring Works

An Ecological Clerk of Works (ECoW) will inspect the Site in advance of works commencing and will undertake monthly inspections to ensure that the construction phase is completed in line with the mitigation measures detailed within this EcIA and the plans submitted in support of this planning application. The ECoW will undertake additional inspections as required during the works.

In addition, the ECoW will either deliver or provide the resident engineer with sufficient environmental information to deliver a Site induction to all personnel working onsite.

4 STUDY RESULTS

4.1 Desk Based Study

Prior to conducting any field surveys, a desk-based review of information sources was completed. This baseline information provided a valuable insight into the types of flora and fauna that may occur onsite and allowed for the identification of features / habitats located off-site that may require further assessment.

4.1.1 European Designated Sites

In accordance with the European Commission Methodological Guidance [31] and policies BE 15-2 a) and BE 15-2 e) of the CCDP [8], a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government [32] states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely significant effects of the project. The key variables determining whether or not a particular European site is likely to be negatively affected by a project are:

- The physical distance from the project to the European site;
- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the OPR guidelines [9], few projects have a zone of influence this large, however the identification of Natura 2000 sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs in 15km have been identified for consideration as part of the screening.

There are four (4No.) European sites located within 15km of the Site - these are identified in Figure 4-1 and Table 4-1.

Figure 4-1: European Designated Sites within 15km of the Site

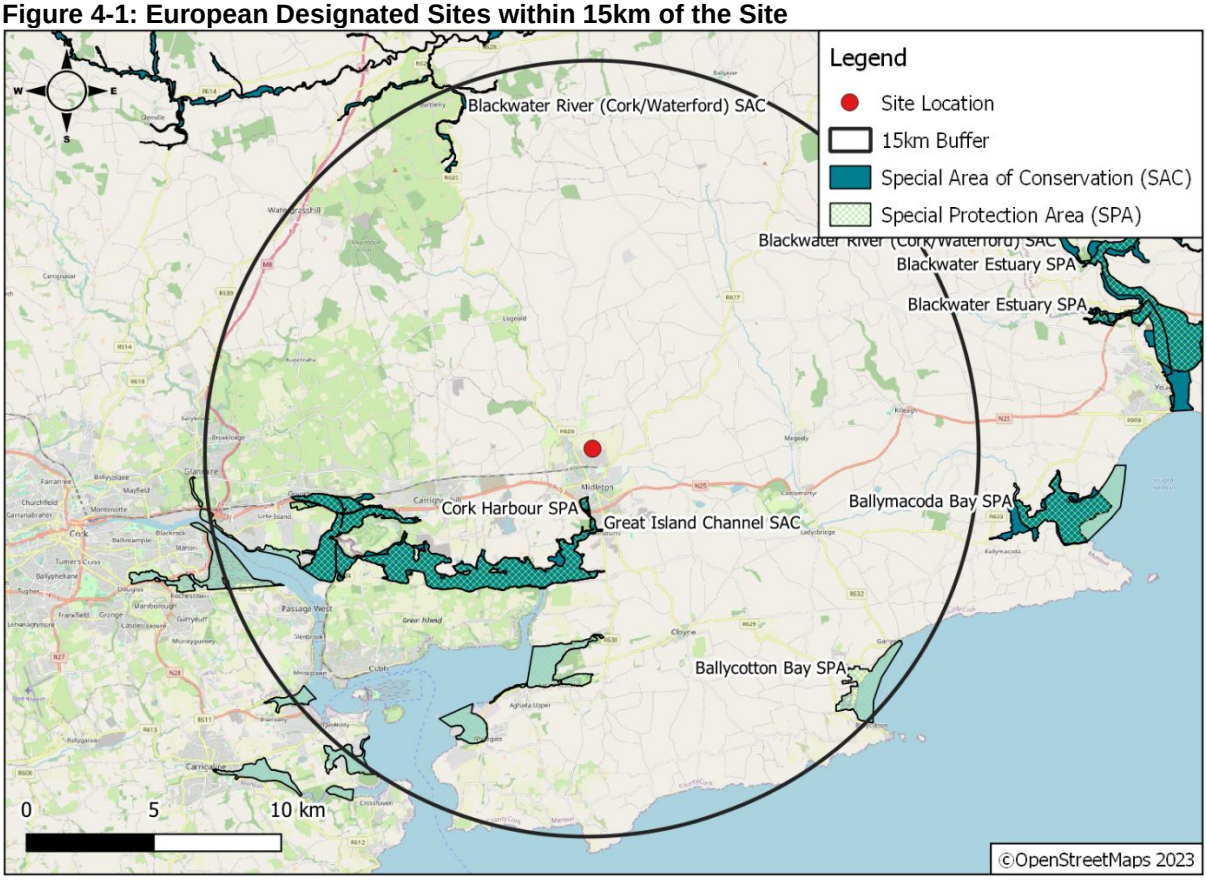


Table 4-1: Natura 2000 Sites within 15km of the Site

Site Name	Code	Distance (km)	Direction from the Site
Special Areas of Conservation (SAC)			
Great Island Channel SAC	001058	1.6km	S
Blackwater River (Cork / Waterford) SAC	002170	12km	NW
Special Protection Area (SPA)			
Cork Harbour SPA	004030	1.6km	S
Ballycotton Bay SPA	004022	13km	SE

The Site is not located within or directly adjacent to any Natura 2000 sites, however, the boundaries of two (2No.) SACs and two (2No.) SPAs are located within 15km of the Site.

Further consideration to the European Designated sites listed in Table 4-1 is provided in the Stage 1: Appropriate Assessment that has been submitted as part of the overall planning application.

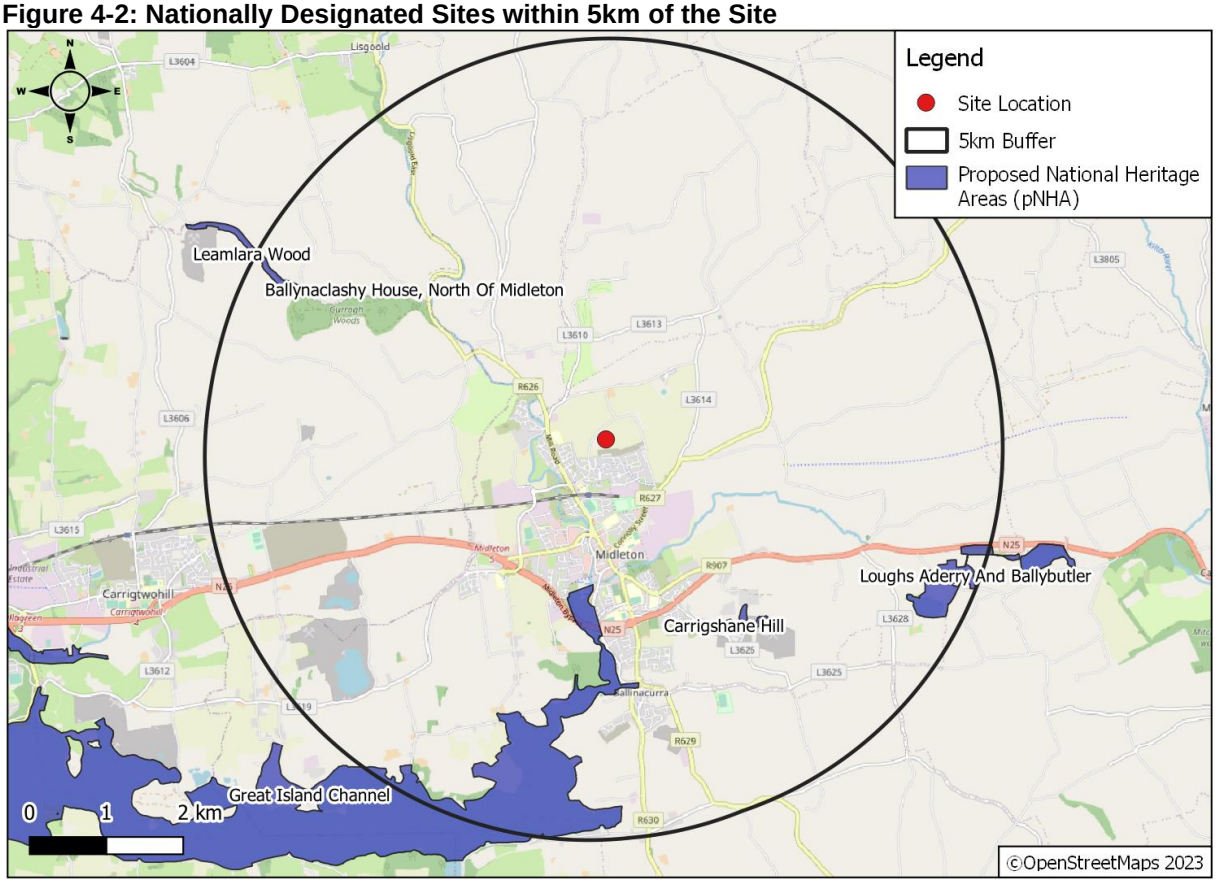
4.1.2 Nationally Designated Conservation Sites

No Natural Heritage Areas (NHA) are located within 5km of the Site. However, five (5No.) Proposed Natural Heritage Area (pNHA) is located within 5km of the Site (refer to Table 4-1 and Figure 4-2).

Table 4-2: National Protected Sites within 5km

Site Name	Code	Distance (km) & Direction	Qualifying Interest
Proposed National Heritage Areas (pNHA)			
Great Island Channel	001058	1.7km SW	As per the Great Island Channel SAC.
Carrigshane Hill	001042	2.6km E	This pNHA contains exposed limestone and associated rich calcicole flora. Of particular interest is the thick-leaved stonecrop (*Sedium dasphyllum*), a native species of Cork which is found in limited location around the county.
Ballynaclashy House, North of Midleton	000099	3km NW	This pNHA had a nursery colony of the Whiskered Bat (Myotis mystacinus) recorded in the attic of Ballynaclashy House, north of Midleton, Co. Cork, in 1987. As the national population of this species is only several hundred, all nursery coloniesare of national importance.
Loughs Aderry and Ballybutler	000446	4.2km NE	This pNHA is of particular interest due to the presence of Orange Foxtail (Alopecurus aequalis) and the Irish Red Data Book species, Musk Thistle (Carduus nutans). It is also of ornithological importance due to its nationally important numbers of Gadwall. Part of the Site, Lough Aderry, is designated as a Wildfowl Sanctuary whilst Ballybutler Lake is a statutory nature reserve.
Leamlara Wood	001064	4.2km NW	This pNHA is of particular interest due to the wood being dominated by oak (Quercus spp.). The area also contains Hazel (Corylus avellana), birch (Betula spp.), willow (Salix spp.), Holly (Ilex aquifolium) beneath the oaks. The ground flora consists of Bramble (Rubus fruticosus agg.), Great Wood-rush (Luzula sylvatica), Hay-scented Buckler-fern, (Dryopteris aemula) and Hard Fern (Blechnum spicant). The abundance of Hay-scented Buckler-fern is noteworthy is considered vulnerable in European terms.

Figure 4-2: Nationally Designated Sites within 5km of the Site



4.1.3 Protected Species

Table 4-3 provides a summary of records of legally protected or otherwise notable species that occur within a 2km grid square of the Site boundary [13].

The parameter of 10 years was chosen to allow for habitat adaption and modification. It is considered that any records over 10 years old are not representative of the current distribution of species populations. CIEEM's guidelines recommend that consideration be given to the biodiversity conservation value of the species that occur within this zone of influence (as appropriate) [33].

Table 4-3: NBDC Species within 2km of the Site

Common Name	***Scientific Name***	**Date of last record**	**Designation**
Bird Species			
Arctic Tern	*Sterna paradisaea*	05/12/2017	Wildlife Acts 1976 / 2000 EU Birds Directive Annex I Bird Species Birds of Conservation Concern Amber List
Barn Swallow	*Hirundo rustica*	20/05/2019	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List

Common Name	***Scientific Name***	**Date of last record**	**Designation**
Bar-tailed Godwit	*Limosa lapponica*	05/12/2017	Wildlife Acts 1976 / 2000 EU Birds Directive Annex I Bird Species Birds of Conservation Concern Amber List
Black-tailed Godwit	*Limosa limosa*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Greenshank	*Tringa nebularia*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Redshank	*Tringa totanus*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Shelduck	*Tadorna tadorna*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Starling	*Sturnus vulgaris*	02/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Swift	*Apus apus*	26/05/2022	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Wood Pigeon	*Columba palumbus*	05/12/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section I Bird Species
Dunlin	*Calidris alpina*	05/12/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Bird Species Birds of Conservation Concern Amber List
Eurasian Curlew	*Numenius arquata*	05/12/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section II Bird Species Birds of Conservation Concern Red List
Eurasian Oystercatcher	*Haematopus ostralegus*	07/03/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List

Common Name	***Scientific Name***	**Date of last record**	**Designation**
Eurasian Teal	*Anas crecca*	05/12/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section II Bird Species Birds of Conservation Concern Amber List
Eurasian Wigeon	*Anas penelope*	05/12/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section II Bird Species Birds of Conservation Concern Amber List
Great Cormorant	*Phalacrocorax carbo*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Great Crested Grebe	*Podiceps cristatus*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Herring Gull	*Larus argentatus*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
House Martin	*Delichon urbicum*	20/05/2019	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
House Sparrow	*Passer domesticus*	28/05/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Little Egret	*Egretta garzetta*	02/04/2021	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Bird Species
Little Grebe	*Tachybaptus ruficollis*	05/12/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Mallard	*Anas platyrhynchos*	02/04/2021	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section I and Annex III and Section I Bird Species
Mew Gull	*Larus canus*	16/11/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List

Common Name	***Scientific Name***	**Date of last record**	**Designation**
Northern Lapwing	*Vanellus vanellus*	05/12/2017	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section II Bird Species Birds of Conservation Concern Red List
Rock Pigeon	*Columba livia*	22/05/2015	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section II Bird Species Birds of Conservation Concern Amber List
Stock Pigeon	*Columba oenas*	21/04/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Yellowhammer	*Emberiza citrinella*	08/04/2021	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Invasive species			
Himalayan Balsam	*Impatiens glandulifera*	07/09/2022	Invasive Species: High Impact Invasive Species
Japanese Knotweed	*Fallopia japonica*	12/08/2021	Invasive Species: High Impact Invasive Species
Nuttall's Waterweed	*Elodea nuttali*	11/102018	Invasive Species: High Impact Invasive Species
Three-cornered Garlic/Leek	*Allium triquetrum*	21/04/2020	Invasive Species: Medium Impact Invasive Species
Bat Species			
Daubenton's Bat	*Myotis daubentonii*	08/08/2014	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	04/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Soprano Pipistrelle	*Pipistrellus pygmaeus*	04/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Amphibians			
Common Frog	*Rana temporaria*	28/08/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
Terrestrial			
Eurasian Badger	*Meles meles*	27/07/2016	Wildlife Acts 1976 / 2000

Common Name	*Scientific Name*	Date of last record	Designation
Eurasian Red Squirrel	*Sciurus vulgaris*	17/03/2022	Wildlife Acts 1976 / 2000
European Otter	*Lutra lutra*	23/11/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II EU Habitats Directive Annex IV
West European Hedgehog	*Erinaceus europaeus*	21/04/2021	Wildlife Acts 1976 / 2000

*Table 3-3 only includes invasive species regulated under S.I. 477 (Ireland)

4.2 Field Survey

The following section provides details of the field-based assessments that were undertaken for the Proposed Development between February and July 2023. The habitats described below were all located within and adjacent to the Site and are presented in Figure 4-4.

4.2.1 Habitats

Stone Walls / Earth Banks (BL1 / BL2)

Fragmented stone walls / earth banks formed the base of a small section of the hedgerows around the Midleton Water Treatment plant as seen in Figure 4-1. the Site.

Improved Agricultural Grassland (GA1)

The fields within the Site consisted of improved agricultural grassland. These areas were mainly comprised of a perennial rye (*Lolium perenne*) monoculture and were therefore, species poor. However, the following additional species were noted within some of these fields: creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), and dandelion (*Taraxacum officinale*).

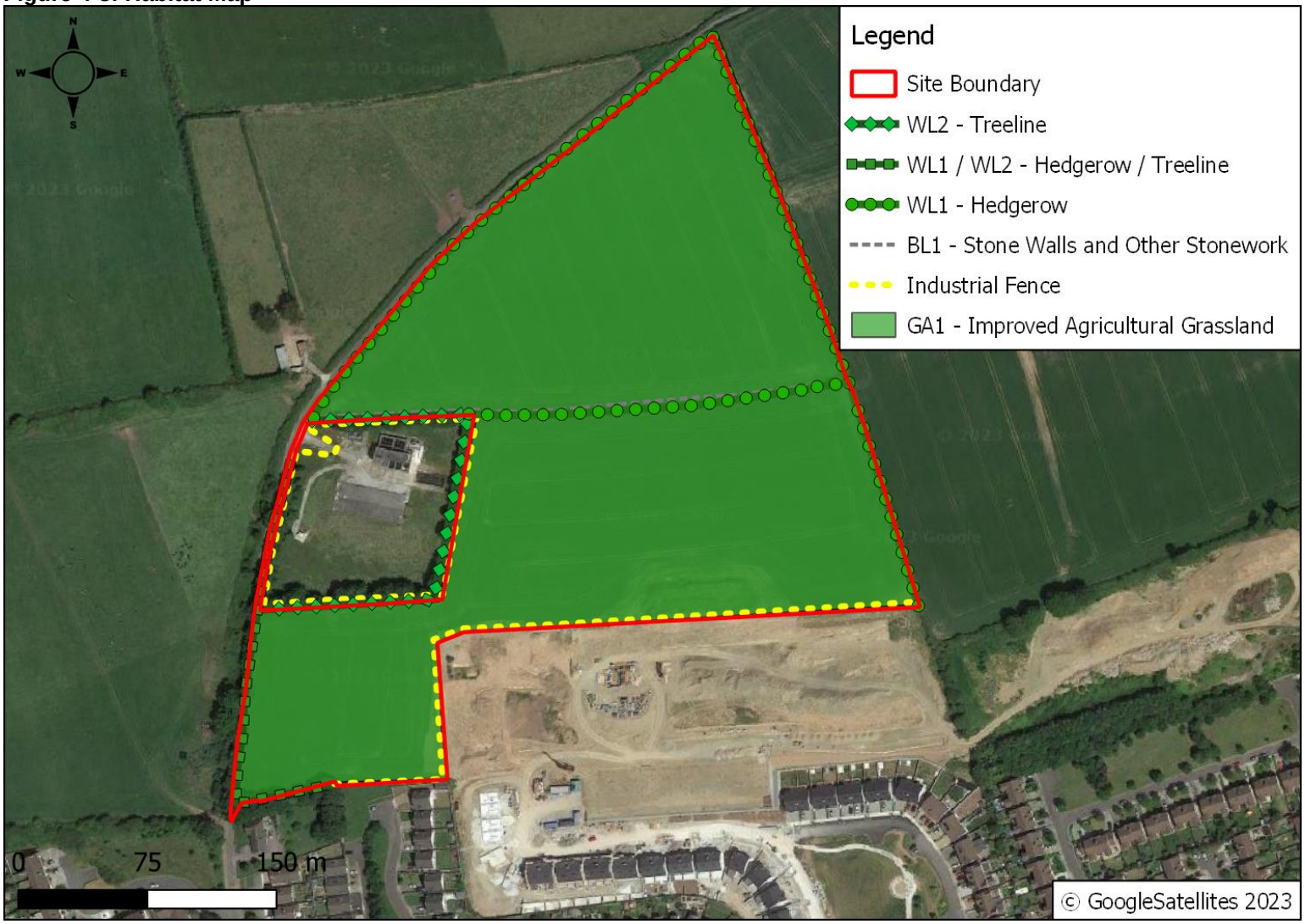
Hedgerow / Treeline (WL1 / WL2)

Hedgerows / treelines formed the principal boundaries within the Site. These habitats are a key feature of the Site, consisting of predominantly well-structured and good-quality trees and hedgerows. These linear features comprised the following species: hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*), elder (*Sambucus nigra*), blackthorn (*Prunus spinosa*), elm (*Ulmus procera*), plum trees (*Prunus domestica*)and maple species were also identified onsite. Two fallen dead trees were located in the southwestern field.

The understorey contained a variety of common species such as nettles, docks, ivy (*Hedera helix*), brambles, Cleavers (*Galium aparine*), gorse (*Ulex sp.)*, honeysuckle, wood sage (*Teucrium scorodonia*), bracken (*Pteridium aquilinum*), foxglove (*Digitalis purpurea*), cow parsnip (*Heracleum maximum*), ground ivy (*Glechoma hederacea*), sweet violet (*Viola odorata*), arum lilies (*Zantedeschia aethiopica*), chickweed (*Stellaria media*), and nipplewort (*Lapsana communis).*

The perimeter of the Site is bounded by green industrial fencing around the WWTP, and to the south separating the Site from the other housing developments. The rest if the perimeter comprises of hedgerows reinforced with agricultural fencing.

Figure 4-3: Habitat Map



4.2.2 Protected / Notable Species

Flora

No plant species protected under the Flora Protection Order were recorded onsite.

Amphibians

The NBDC contains one record of common frog within 2km of the Site over the last 10 years [13], no other records of amphibians were recorded, and no evidence of amphibians was recorded during the field surveys.

The absence of hydrological features onsite would exclude the Site from being considered suitable for breeding amphibians. However, the improved agricultural grasslands have the potential to provide suitable habitat for amphibians during the terrestrial phase of their life cycle.

Badgers

The NBDC holds records for badgers within 2km of the Site within the last 10 years [13]. However, no badger evidence i.e., no potential setts were recorded during the field survey and no direct evidence of badger activity in the form of feeding remains, snuffle holes, prints, scat or latrines was identified onsite.

It should be noted that mammal paths were recorded throughout the Site. However, it is considered that these were utilised by smaller mammals based on their size and shape, see terrestrial mammals below.

Although no direct evidence of badger was found onsite, this species may use the hedgerow / treelines bounding the agricultural fields within and adjacent to the Site for foraging and commuting.

Bats

The Site is located within a predominantly rural landscape with extensive areas of open agricultural land and hedgerows / treelines both onsite and in the surrounding area. As per the NBDC landscape suitability metric, the Site and surrounding area is divided between two levels of suitability.

The northern half of the Site is considered to be of low suitability for bats (Landscape Suitability Metric Score: 13 - 21.3) while the southern half is of high suitability (Landscape Suitability Metric Score: 28.1 – 36.4) [13]. Additionally, the NBDC holds several records of bat species within 2km of the Site over the last 10 years [13].

The well-established hedgerows / treelines which border the Site provide suitable foraging habitat and connectivity to the wider landscape for commuting bats. The areas of improved agricultural grassland and arable crops are also suitable foraging habitats for bats. However, the Site does not provide any suitable roosting habitat for bats.

Birds

The hedgerows / treelines onsite are considered suitable for a range of nesting birds. Table 4-3 and 4-4 contain summaries of the birds recorded onsite and their status according to the Birds of Conservation Concern in Ireland (BoCCI), which is the third assessment of the status of all regularly occurring birds on the island of Ireland [1].

A total of nine (9No.) species were recorded onsite or were flying over the Site and immediately adjacent fields during the winter bird surveys, see Table 4-3. Of these species, only five (5No.) species were recorded foraging within the Site – greater black-backed gull, lesser black-backed gull, common gull, black-headed gull and herring gull.

None of these species were considered to utilising the Site and were not observed displaying territorial behaviours.

Table 4-4: Winter Bird Surveys 2023 (VP)

BoCCI Status	Species	Latin	Number Recorded		Observed Behaviour
			22/02/2023	27/03/2023	
Green-listed	Buzzard	*Buteo buteo*	-	2	Soaring
	Sparrowhawk	*Accipiter nisus*	-	1	Flying
Amber-listed	Great Black-backed Gull	*Larus marinus*	9	-	Foraging, soaring
	Kestrel	*Falco tinnunculus*	1	1	Commuting, flying
	Lesser Black-backed Gull	*Larus fuscus*	2	6	Foraging, soaring
	Snipe	*Gallinago gallinago*	-	3	Flying, flushed
	Common Gull	*Larus canus*	-	40	Foraging
Red-listed	Black-headed Gull	*Chroicocephalus ridibundus*	-	64	Flushed, foraging
	Herring Gull	*Larus argentatus*	5	20	Commuting, circling, foraging, flying

Table 4-5: Country/Breeding Bird Survey (Transect)

BoCCI Status	Species	Latin	Number Recorded				Observed Behaviour
			14/04/23	09/05/23	14/6/23	27/07/23	
Green-listed	Blackbird	*Turdus merula*	6	4	3	2	Perched, flushed
	Dunnock	*Prunella modularis*	1	-	3	-	Calling, flying
	Long-tailed Tit	*Aegithalos caudatus*	1	-	-	-	Calling
	Rook	*Corvus frugilegus*	6	9	-	18	Foraging, flying, perched
	Woodpigeon	*Columba palumbus*	5	3	-	3	Flushed, flying, perched
	Wren	*Troglodytes troglodytes*	9	5	10	1	Calling, perched

	Mistle Thrush	*Turdus viscivorus*	-	1		-	Flying
	Bluetit	*Cyanistes caeruleus*	-	2	1		Calling, Perching
	Herring Gull	*Larus argentatus*	-	2	-		Flying
	Great Tit	*Parus major*	-	-	4	3	Calling, Perching
	Song Thrush	*Turdus philomelos*	-	-	3	1	Foraging, Calling
	Stonechat	*Saxicola rubicola*	-	-	1	-	Perching
	Blackcap	*Syliva atricapilla*	-	-	-	1	Calling, Perching
	Robin	*Erithacus rubecula*	-	-	-	1	Calling, Perching
	Hooded Crow	*Corvus cornix*	-	-	-	1	Foraging
	Goldfinch	*Carduelis carduelis*	-	2	12	2	Calling, Perching
	Chaffinch	*Fringilla coelebs*	-	2	-	1	Calling, Perching
	Great Black-backed Gull	*Larus marinus*	5	-	-	-	Foraging, flying
Amber-listed	House Sparrow	*Passer domesticus*	2	1	-	-	Calling, defensive
	Linnet	*Linaria cannabina*	3	-	2	-	Flying, calling
	Skylark	*Alauda arvensis*	2	-	-	-	Perched, flying
	Starling	*Sturnus vulgaris*	-	24	-	-	Flying, Foraging
	Swallow	*Hirundo rustica*	-	6	6	-	Flying, Foraging
	Herring Gull	*Larus argentatus*	1	2	-	-	Flying
Red-listed	Yellowhammer	*Emberiza citrinella*	-	1	2	5	Calling, Perching
	Meadow Pipit	*Anthus pratensis*	1	-	-	-	Flying

Otters

The NBDC holds records of otter within 2km of the Site over the past 10 years [13], however no evidence of otter i.e., spraint, holts, couches, was found onsite. Additionally, no suitable habitats for otter were identified onsite given the lack of watercourses onsite and that the Site is located over 450m away from the closest watercourse, the Owenacurra River.

Terrestrial Mammals

The NBDC holds records for red squirrel and hedgehog within 2km of the Site within the last 10 years [13]. No evidence of these specific species was recorded onsite.

The hedgerow / treelines bounding the agricultural fields Site have the potential to support foraging and commuting hedgehogs and read squirrel. Although no direct evidence of these species was recorded onsite, it should be noted that a number of small mammal paths were identified that may be utilised by these species.

Invasive Species

The NBDC holds records of Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), Nuttall's waterweed (*Elodea nuttali*), three-cornered garlic/leek (*Allium triquetrum*) within 2km of the Site [13]

These species are non-native, medium/highly invasive plant species subject to restrictions under Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) [34].

However, none of these invasive species were identified onsite.

Other Species

No other species of conservation concern were noted onsite or were contained in NBDC records.

5 CHARACTERISTICS AND POTENTIAL IMPACTS OF THE PROPOSED WORKS AND MITIGATION MEASURES

5.1 Sensitive Design

Specialist ecological input was a key element of the proposed design, to ensure that the design layout of the Proposed Development is sensitive to valued ecological features that occur or may occur within the Site and the surrounding landscape.

In order to minimise the adverse effects of the Proposed Development on biodiversity and, where possible, enhance the ecological value of the Site, a range of environmental measures have been incorporated into the project at the design stage. The key measures relevant to biodiversity for this project have been detailed below:

- A comprehensive Landscape Plan has been developed for the Proposed Development which includes ecological enhancement measures. For full details please refer to the Landscape Plan submitted as part of the overall planning application;
- All vegetation removal required onsite will be undertaken in accordance with relevant legislation to avoid potential disturbance to nesting birds. These works will be undertaken outside the period of 1st of March to 31st of August; and,
- All boundary trees and hedgerow / treelines that are to be retained will be protected from unnecessary damage, appropriate mitigation measures are outlined in Arboricultural Report submitted as part of the overall planning application.

5.2 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 2.4, Table 5-1 sets out the findings of the evaluation of important and legally protected receptors. Each receptor is assessed and a scoping justification for each receptor is provided for the construction and operational phases of the Proposed Development.

Table 5-1: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Protected Sites				
European Designated Sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation.	An Appropriate Assessment (AA) has been prepared as part of the overall planning application in line with policies BE 15-2 a) and e) of the CCDP [8]. The AA concluded that the Proposed Development would not cause any adverse effects on any European designated sites or any of their designated features of interest provided the mitigation measures incorporated within the AA are adhered to and that progression to Stage 2 of the Appropriate Assessment process (i.e., Natura Impact Statement) was not considered necessary. For full details on the assessment of impacts to European designated sites, refer to the AA submitted as part of planning.	European Designated Sites have been scoped in for further consideration. Refer to the AA report submitted as part of planning for further details.
Nationally Designated Sites	Wildlife Act 2000 (as amended)	Nationally designated sites for conservation.	Nationally designated conservation sites within 5km of the Site were investigated as per BE 15-2 a) of the CCDP [8].There are no NHAs within 5km of the Site but there is one (1No.) pNHA. Impacts on pNHAs can be discounted given the intervening urban and agricultural land, lack of hydrologically connection, and the distances separating these sites from the Proposed Development.	Nationally Designated Sites have been scoped out from further consideration
Habitats				
Stone Walls / Earth banks (BL1/BL2)	N/A	Low Local Value	The stone walls/earth banks onsite are not of significant conservation value and their loss is not considered significant. Therefore, the impact of the Proposed Development on this habitat is not significant in relation to ecology and this receptor has been scoped out from further consideration.	Stone Walls / Earth banks have been scoped out from further consideration
Improved Agricultural Grassland (GA1)	N/A	Low Local Value	This is a common habitat type throughout Ireland and provides limited ecological value. This habitat is not of significant conservation value and the loss is not considered significant. Therefore, the impact of the Proposed Development on this habitat is not significant and this receptor has been scoped out from further consideration.	Improved Agricultural Grassland has been scoped out

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
				from further consideration
Hedgerows (WL2) / Treelines (WL1)	Wildlife Act 2000 (as amended)	Low Local Value	Vegetation removal has been proposed as part of the Proposed Development, however compensatory planting is proposed along the borders of the Proposed Development. This includes a planting scheme of ca. 635 No semi-mature and advanced tree's along with a foraging corridor along the western boundary of the Water Treatment Facility to replace the low-quality hedgerow. Mitigation measures are also required to protect any retained vegetation onsite or within the immediate vicinity of the Site from damage, as per BE 15-2 c), BE 15-6 b), and BE 15-8 of the CCDP [8]. Appropriate mitigation measures will be implemented considering notable / protected species. These mitigation measures will also be implemented for any vegetation removal onsite, refer to Section 5.3.1 for further details.	Hedgerows and Treelines have been scoped in for further consideration
Flora and Fauna				
Flora	Flora (Protection) Order 2022 (S.I. No. 235/2022)	N/A	No plant species protected under the Flora Protection Order were noted onsite. Overall, the impact of the Proposed Development on protected flora is considered unlikely to be significant. Therefore, this receptor has been scoped out from further consideration.	Flora species have been scoped out from further consideration
Amphibians	Wildlife Act 2000 (as amended) EU Habitats Directive Annex V	Low Local Value	The Site is not considered to be of significant value to amphibians given the fact that no evidence of amphibians was identified onsite and no suitable waterbodies / drainage ditches for breeding amphibians were recorded. However, should any amphibians be discovered onsite during the construction works, the ECoW will be consulted for advice and any works that have the potential to impact on amphibians will cease until appropriate mitigation measures are in place. However, no species-specific mitigation is required at this stage and this receptor has been scoped out from further consideration.	Amphibians have been scoped out from further consideration
Bats	Wildlife Act 2000 (as amended)	Low Local Value	Based on the field surveys, it is considered that the Site is of low ecological value for bats. There are no trees with bat roost potential and no buildings or structures within the Site boundary. The habitats onsite are considered sub-optimal for foraging and commuting bats and it is not considered that the loss of onsite habitats will be significant with regards to bats.	Bats have been scoped in for further consideration

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
	EU Habitats Directive Annex IV		Nonetheless, a sensitive lighting strategy will be implemented as part of the Proposed Development, thus ensuring no adverse effects on nocturnal species (including bats) within the wider area. Therefore, bats have been scoped in for further consideration. Should any bats be discovered onsite during the construction works, the ECoW will be consulted for advice and any works that have the potential to impact on bats will cease until appropriate mitigation measures are in place.	
Badgers	Wildlife Act 2000 (as amended)	Low Value Local	Following the initial walkover, no badger evidence was recorded in the fields within the Site. However, the NBDC does hold some records for badger within 2km within the last ten (10No.) years. Should any badgers be discovered onsite during the construction works, the ECoW will be consulted for advice and any works that have the potential to impact on badgers will cease until appropriate mitigation measures are in place. Given the nature of the Site it is likely that badgers would commute through the area and so they have been scoped in for further consideration.	Badgers have been scoped in for further consideration
Otter	Wildlife Act 2000 (as amended)	Low Value Local	No otter activity or suitable habitat was noted within or adjacent to the Site. The NBDC does hold a record for otter within 2km of the Site within the last ten (10No.) years. However, given the lack of connectivity between the Site and any watercourses, and the distance from the closest watercourse (over 450m from the Owenacurra River) it can be concluded that the Site is of no value to otter. Should any otter be discovered onsite during the construction works, the ECoW will be consulted for advice and any works that have the potential to impact on otter will cease until appropriate mitigation measures are in place. However, no species-specific mitigation is required at this stage and this receptor has been scoped out from further consideration.	Otter have been scoped out from further consideration
Birds	<u>Nesting Birds</u> Wildlife Act 2000 (as amended)	Low Value Local	The treelines / hedgerows onsite are considered to provide suitable nesting habitat for breeding bird species. Any temporary disturbance arising from the proposed construction works is not considered to be significant given the amount of disturbance already within the area from other construction developments. In addition, there are alternative / more suitable habitats within the wider area for any birds affected by the proposed works to disperse into. Nonetheless, precautionary mitigation will be implemented to avoid any potential impacts to breeding birds, refer to Section 5.3 below for further details.	Birds have been scoped in for further consideration

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Terrestrial Mammals	Wildlife Act 2000 (as amended)	Low Local Value	Given the presence of suitable habitats onsite and within the wider area for hedgehogs and other nocturnal and terrestrial species, standard protection measures for these species will be incorporated into the construction works in line with policies of the CCDP [8], refer to Section 5.3.	Terrestrial Mammals have been scoped in for further consideration
Invasive Species	N/A	N/A	Given the potential for invasive species within the wider area entering the proposed construction area, standard measures will be implemented in order to ensure no invasive species are introduced onsite during the construction phase (see Section 5.3). This is in compliance with policy BE 15-7 of the CCDP [8].	Invasive Species have been scoped in for further consideration
Other Species	N/A	N/A	No other species of conservation interest were noted onsite. However, given the presence of suitable habitats onsite and within the adjacent lands for common species such as foxes, rabbits and other terrestrial mammals, standard protection measures for these species will be incorporated into the works in line with policies of the CCDP [8].	Other Species have been scoped in for further consideration

5.2.1 Summary of Potential Impacts

Following a detailed assessment, the following receptors were identified as having the potential to be impacted by the Proposed Development works and were brought forward for further consideration:

- Hedgerows (WL2) / Treelines (WL1);
- Bats;
- Badgers;
- Birds;
- Terrestrial Mammals;
- Invasive Species; and,
- Other species.

As per the scoping justification outlined in Table 5-1, further consideration was required for each of the receptors listed above in order to develop appropriate mitigation to protect these receptors and avoid impacts arising from the Proposed Development refer to Section 5.2 below for further details.

5.3 Mitigation Measures

5.3.1 Construction Phase

During the construction phase, all works will comply with all relevant legislation and best practice to reduce any potential environmental impacts. A CEMP will be prepared by the appointed main contractor and will be submitted to the planning authority in advance of works commencing as detailed in Section 3.6.

The following mitigation measures will be incorporated and adhered to in order to ensure that the proposed works do not result in any contravention of wildlife legislation:

- All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EcIA and the AA will be fully adhered to;
- The Site manager shall ensure that all personnel working onsite will be trained and made aware of the mitigation measures detailed within this EcIA and the AA;
- An ECoW will inspect the Sites in advance of works commencing and will undertake Site inspections as required during the works to ensure that they will be completed in line with the mitigation measures detailed within this EcIA, the AA and the CEMP;
- If protected or notable species are encountered during operations at the Site, the ECoW will be contacted for advice; and,
- In advance of works, all Site personnel will receive a toolbox talk regarding notable and protected species. Everybody working onsite must understand the role and authority of the ECoW.

5.3.1.1 General Best Practice Mitigation Measures

These measures will be put in place to remove the risk from potential contamination and will include emergency procedures to be implemented in the event of an accidental release of potentially contaminating substances as outlined below. Despite the lack of surface watercourses, the Site is located over extremely vulnerable groundwater sources [35] and so best practice procedures will be implemented for their protection and for the protection of the surrounding environment. These procedures will be communicated to all relevant site staff. These measures include the following:

- The working area working area will be clearly defined and construction activities will be carefully planned to minimise ground disturbance;
- Prior to the commencement of earthworks, silt fencing will be installed along the boundary of the development works. These silt fences will remain in place throughout the entire construction phase;
- The proposed working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance;
- Existing vegetation will be retained where possible and runoff will be diverted away from stripped areas;
- The works area onsite will be sprayed during periods of dry weather in order to suppress dust migration from the Site;
- Weather conditions will be considered when planning construction activities to minimise risk of runoff from the proposed works;
- All construction works associated with the storm drainage infrastructure including new land drains and the installation of closed carrier pipes and petrol interceptors will be

completed, cleaned and inspected in advance of connecting into the existing river network;

- Daily monitoring of excavations / earthworks will be completed by a suitably qualified person during the construction phase;
- The ECoW will undertake monthly inspections of all surface water treatment measures, including petrol interceptors, to ensure that these features have been installed appropriately.

The following mitigation measures will be implemented during the proposed works to minimise the likelihood of oil / fuel release to the surrounding environment during refuelling of equipment:

- Prior to any works commencing, all construction equipment will be checked to ensure that they are mechanically sound to avoid leaks of oil, fuel, hydraulic fluids and grease;
- Preventative maintenance and relevant maintenance logs will be kept for all onsite plant and equipment;
- The Appointed Contactor will put in place a specific, step-by-step refuelling procedure which will be communicated to all relevant employees onsite;
- Only designated trained operators will be authorised to refuel plant onsite;
- Refuelling of plant and machinery will be completed in a controlled manner using drip trays (bunded container trays) in a dedicated refuelling area;
- All oil stored onsite for construction vehicles will be kept in a lock and bund protected area;
- Bunds for the storage of hydrocarbons and chemicals during construction will have a holding capacity of 110% of the volume to be stored and will be regularly inspected for leaks and signs of damage; and,
- Procedures and contingency plans will be set up to deal with emergency accidents or spills. Only emergency breakdown maintenance will be carried out onsite.

Poured concrete will be utilised for ancillary infrastructure associated with the Proposed Development. However, as mentioned above, concrete will be pre-cast, where possible, to reduce the need for concrete pouring. The following measures will be implemented to protect the surrounding environment during concrete pours:

- The production, transport and placement of all cementitious materials will be strictly planned and supervised;
- All concrete pours will be carried out in dry weather;
- Shutters will be designed to prevent failure;
- Chemicals used will be biodegradable where possible;
- Any spillages will be cleaned up immediately and disposed of correctly;
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
- No washing of plant or equipment will be permitted onsite;

- Concrete washing from smaller equipment will be collected and disposed of offsite; and,
- Surplus concrete will be returned to batch plant after completion of a pour.

The proposed measures to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below:

- Adequate spill kits including absorbent booms and other absorbent material will be maintained onsite;
- All contractor workers will be appropriately trained in the use of spill kits;
- Any spillages will be cleaned up immediately and disposed of correctly; and,
- Any sediments impacted by contamination will be excavated and stored in appropriate sealed containers for disposal offsite in accordance with all relevant waste management legislation.

Therefore, following the implementation of the above mitigation measures, it is concluded that the works required for the Proposed Development will not adversely affect the water quality of the surrounding environment.

In addition, an Ecological Clerk of works (ECoW) will be appointed to the project to ensure that the mitigation and best practice measures will be fully implemented. Therefore, the mitigation measures outlined above will minimise the identified potential risks to water quality associated with the construction phase of the Proposed Development

5.3.1.2 Protection Measures for Trees and Root Systems

The Proposed Development will require the removal of sixteen (16No.) trees in the southwest corner of the Site, as outlined in the Arboricultural Report. All other hedgerows and trees that will be retained as part of the Proposed Development will be protected from any damage or impacts. Mitigation measures outlined in the Arboricultural Report will be adhered to and implemented throughout the construction phase.

Please refer to the Arboricultural Report submitted as part of the planning for further details and mitigation measures.

5.3.1.3 Protection Measures for Species

Badgers and other Terrestrial Mammals

As outlined in Section 4.2, the onsite habitats have features that have the potential to support foraging and commuting mammals such as badger and hedgehogs. Therefore, in order to ensure that the works in relation to the Proposed Development will not have significant impacts on terrestrial mammals, general construction procedures and mitigation measures will be undertaken. These mitigation measures are in line with the NRA (now TII) guidance for badgers and in combination with those outlined in section 5.3.1.2 for the protection of hedgerows and treelines above will minimise any disturbance to any notable species utilising the Site. These include the following measures:

- Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required;
- All vegetation clearance will be undertaken in a systematic way to allow any potential species that may be utilising these areas to disperse naturally as works progress;
- New drainage infrastructure will be laid in sections and backfilled;

- Waste will be kept contained in a designated area to avoid animals becoming trapped in litter;
- Where deep excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed; and,
- If unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice.

The construction works will be short-term, and as terrestrial mammals are highly mobile, it is likely that they will move away from any temporary disturbances. However, to reduce the potential for disturbance to wildlife from noise, the following mitigation measures will be implemented during the construction phase:

- Avoid unnecessary revving of engines and switch off equipment when not required;
- Minimise the drop height of materials;
- Start-up plant and vehicles sequentially rather than all together;
- Review planting equipment onsite to ensure that they are the quietest versions available for the required purpose; and,
- Noise construction works will be limited to 7am to 6pm on the weekdays and 8am to 2pm on Saturdays.

Birds

In order to ensure that no disturbances occur to breeding birds that may potentially use the Site or the adjacent lands, the following mitigation measures will be put in place:

- Any vegetation clearance required within the Site will take place outside of the nesting bird season (1st March to 31st August). Vegetation clearance is restricted as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;
- In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS and under the supervision of the project ECoW;
- Prior to vegetation removal the ECoW will inspect the Site. The management and removal of vegetation onsite will be undertaken in a systematic way, under the direction of the ECoW, to ensure that the retained hedgerows / treelines are not damaged by the works; and,
- Should birds nest within the active working area during the construction phase, works within the area will stop within the area and the project ECoW will be consulted.

Invasive Species

To mitigate against the unintentional introduction of invasive species during construction, the following biosecurity measures will be implemented. These measures are in line with NRA (now TII) *Guidance for the Management of Noxious Weeds and Non-Native Invasive Plant Species* [36]:

- All vehicles, machinery and any other equipment that may be used for the works will be washed prior to its use onsite to prevent the import of plant material and seeds;
- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;

- All materials to be imported to the Site, including additional planting, will be sourced from a reputable supplier and records of all material / supplies to Site will be maintained; and,
- In advance of works, all site personnel will receive an induction regarding invasive species.

Other Species

With the mitigation measures outlined above, no significant impacts on other flora and fauna are expected, therefore, no mitigation additional to the ones specified above are required.

5.3.2 Operational Phase

Operational phase impacts for the Proposed Development relate only to water quality and nocturnal species (i.e., bats and nocturnal mammals).

5.3.2.1 Protection of Water Quality during Operation

Due to the additional infrastructure onsite, there will be increased areas of hardstanding with the potential to generate increased storm water runoff. The drainage system described in Section 3.3.1 will proposes a network of gravity sewers that will be installed to service the Proposed Development. Surface water will be collected from all hardstanding and impermeable surfaces. The piping network will be appropriately designed using SuDs drainage software design to accommodate the discharge volumes.

All storm water will be attenuated to reduce overall runoff to existing pre-development rates and appropriate calculations for the storage volumes will be submitted in this respect. A hydrobrake control will be fitted to the outlet of each attenuation chamber. Each chamber will also be fitted with an upstream oil separator and the grit trap.

Due to the varied topography and the layout of the development, a series of separate attenuation chambers are proposed. It is proposed to discharge the attenuated water to the L7630 public roadway abutting the development to the west. It is proposed to install a new stormwater sewer in this roadway as part of roadway upgrade works and to pipe the runoff in a southerly direction to connect to the existing stormwater pipework in the public roadway at Broomfield Estate.

Stormwater design will be based on a 1:100-year return period with a 20% factor for climate change.

Foul water will be collected by a network of gravity sewers. These will discharge both to the existing Blossomhill estate foul sewer pipework and to a new foul sewer to be constructed in the L7630 public roadway abutting the development to the west.

Foul water pipework sizing will be designed to ensure self-cleansing velocities on all pipe-runs

Irish Water note that they are currently progressing two projects to provide additional wastewater treatment capacity in the area. The first of these projects is due for completion in Q4 2023.

All pipework will be installed in accordance with Irish Water Code of Practice for Wastewater Infrastructure IW-CDS-5030-03.

The estate will be connected to the Irish Water infrastructure. An existing 250mm diameter cast iron water main exists in the L7630 public roadway abutting the development. The estate is also adjacent to the Midleton area water treatment plant.

Irish Water have issued a Confirmation of Feasibility in relation to public water supply to the development, please refer to the Engineering Report.

It is proposed to service the estate with 100mm via Class 'C' watermain pipework. These mains will serve a series of Fire Hydrants throughout the development. Potable water for the individual dwellings will be connected to this watermain supply.

All pipework will be installed in accordance with Irish Water Code of Practice for Water Infrastructure IW- CDS-5020-03.

5.3.2.2 Protection of Fauna

Nocturnal Mammals

Nocturnal mammals (i.e., Bats) are impacted by lighting. Therefore, it is important that lighting installed within the Site is completed with sensitivity for local wildlife while still providing the necessary lighting for human usage. A lighting plan has been prepared by Eneveo and will be submitted as part of the planning application.

The strategy has been developed to mitigate against any potential impacts on nocturnal species in line with the Bat Conservation Trust (BCT) Guidelines on '*Bats and Artificial Lighting in the UK'* [37]. The following measures have been taken into consideration specifically for bat protection during the lighting layout design:

- Avoidance of excessive lighting;
- Light Emitting Diodes (LED's) will be used and the brightness will be set as low as possible;
- Lighting should be aimed only where it is needed, with no upward lighting;
- Lighting should be directed away from landscaped areas and retained sections of hedgerows, treelines and trees;
- Lighting should be turned down / off when not required;
- Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light only where it is needed;
- The height of lighting columns should be reduced as much as possible, as lighting at a low level further reduces ecological impact; and,
- Following the installation of the lighting for the Proposed Development, the project ECoW will undertake a further Site inspection in order to check the lighting patterns and lux levels along the Site boundaries

5.4 Ecological Enhancement Measures

A number of ecological enhancement measures will be incorporated into the overall masterplan for the Site including the planting of amenity and urban woodland trees, a foraging corridor, biodiversity swales and foundation shrubs.

- A planting scheme will be established with 635No. semi-mature and advanced trees. This will consist of 70% native tree species and 30% acclimatised species for use in difficult urban condition where native trees might perform poorly.
- There will be four (4No.) urban woodland treelines / clusters that will also include native understorey planting at a rate of 2No. plants / sq.m.
- A foraging corridor will be established along the western boundary of the Water Treatment Facility to replace the low-quality hedgerow. This will be a mix of flowering and fruit-bearing plants which will benefit both humans and fauna.
- Biodiversity swales will be incorporated into the Site where a percentage of surface water runoff will be captured within swales and attenuation areas prior to entering the

stormwater system. This will enable filtration and reduce the flow / natural attenuation into the ground water table. This will be a mixture of sedges (*Carex spp.)* and creeping buttercup (*Ranunculus repens)* and supplemented with a mix of native damp-meadow species.

- Foundation shrubs will also plant to enhance amenity areas, provide buffers to private residences and for slope mitigation.

6 CONCLUSIONS

Based on the findings of a detailed desk-based study, a review of all the ecological information available for the Site and wider area and field surveys conducted by suitably qualified MOR Ecologists, it is considered reasonable to conclude the following:

- The Site itself is currently considered to be of low local ecological value;
- The Site is not considered to be of high suitability or a site of importance for any Annex I or Annex II species or Red listed birds;
- The Proposed Development will not result in any significant impacts on ecological receptors identified both onsite and in the surrounding area following the implementation of appropriate mitigation measures;
- The proposed Landscape Plan has been designed to compensate for any vegetation removed during Site clearance works.

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