4 ECOLOGY AND BIODIVERSITY

4.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the potential effects that may occur on ecological receptors as a result of proposed activities at the existing Shillelagh Quarries Limited (SQL) quarry site.

This chapter has been prepared by Assistant Ecologist, Sophie McPeake. Sophie has 1.5 years' experience in ecological consultancy and is a Qualifying member of CIEEM. A quality assurance review has been carried out by Steven Tooher ACIEEM, a Principal Ecologist with 9+ years' experience.

Site surveys were conducted by Lisa O'Dowd ACIEEM. Lisa has 4 years' of experience in carrying out a variety of ecological surveys and is classed as 'capable' under CIEEM's competency framework (CIEEM, n.d.).

4.1.1 PROJECT BACKGROUND AND OVERVIEW

The EIAR project unit is located in the townlands of Hempstown Commons, Co. Kildare centered at ITM coordinates 53°12'27.4"N 6°30'43.6"W. The town of Blessington is located ca. 4 km south-west. The Application Site is bound to the north-east by the Kildare / Wicklow border. The lands contiguous to the EIA boundary are generally in agricultural use, predominantly pasture lands with light industrial use consisting of a precast concrete manufacturing facility (Stresslite Floors Ltd) immediately adjacent to the west of the Application Site. A rock quarry is located immediately adjacent to the northern boundary of the Application Site. There are scattered residential properties in the vicinity. The boundaries of the lands owned comprise hedgerows with areas of scrub.

The subject lands have been used for quarrying since the mid-1940s.The proposed development of further extraction is to be in the existing void area with lateral extension of the void proposed in a north-westerly direction. The extraction of rock and processing of aggregate at the Application Site will involve the following:

- Continuation of excavation of rock using a variety of methods, including drilling and blasting, and rock-breaking;
- Continuation of mobile crushing, and screening of the rock into stockpiles of specific fragment sizes;
- Loading of material onto road-going trucks for sale and distribution to market;
- Trucks passing through a weighbridge and wheelwash before leaving the Application Site and travelling onto the N81 via a local road;
- Continuation of pumping collected waters from the quarry floor to the primary soakaway and overflow soakaway, as required.

Other proposed works include:

- Progressive stripping of overburden from the proposed quarry lateral extension area, which will be stored as a series of benches along the north-western wall of the existing quarry pit;

- Relocation of the existing office container, wheelwash and recyled water tank, and weighbridge within the Application Site boundary;
- Installation of a bypass separator prior to discharge of collected waters from the quarry floor into the primary soakaway; and
- Extension of the sump on the quarry floor.

Further details regarding the history of the Application Site and the proposed works are detailed in Chapter 2 (Project Description) of this EIAR.

4.1.2 TECHNICAL SCOPE

The focus of this assessment is centred on the establishment of baseline ecological conditions (flora, fauna and habitat composition), allowing for an assessment of potential impacts of the proposed works, attributed to land take, disturbance and environmental emissions, to be carried out. Full details of proposed works are outlined in Chapter 2 (Project Description).

Desk study data, aerial imagery, information provided by SQL, and field surveys have all been used to determine baseline ecological conditions.

4.1.3 GEOGRAPHICAL SCOPE

The geographical study area for this assessment comprises the area within the EIA boundary[1], which is illustrated in Figure 4-1. In relation to the desk study, variable buffers of the EIA boundary have been adopted to account for varying sensitivity of ecological receptors to potential impacts, and in line with relevant guidelines. Further details on relevant survey buffers used to carry out the desk study can be found in Section 4.3.1.

All proposed works will be within the Section 37L Planning Application Boundary (hereafter the 'Application Boundary'). The lands within the Application Boundary are referred to as the 'Application Site'.

4.1.4 PROJECT DESCRIPTION SUMMARY

A full description of the proposed development is provided in Chapter 2 (Project Description) of this EIAR. A high-level summary of the proposed development is provided below.

The proposed development for further extraction of rock is to be within the existing void area with lateral extension of the void proposed in a north-easterly direction. The estimated total quantity of aggregate resource to be extracted in the life-of-quarry is c. 1,757,500 tonnes. A proposed 12 year life-of-quarry requirement is based on an average production rate of ca. 2,929 tonnes per week for rock. Dry processing of mechanically broken and blast rock onsite will comprise crushing and screening to produce aggregate materials for market.

[1] In accordance with relevant guidance (NRA, 2006), field surveys would typically include a 50 m buffer of any proposed works. However, in this instance, access was not permitted to any lands outside of the EIA boundary.

SQL proposed to relocate the existing office container, wheel wash and water recycling tank, weighbridge to fully within the Application Site to provide space for realignment of the private access lane on SQL lands and to develop dedicated carparking facilities for the quarry operation on SQL owned lands.

The proposed car parking facilities will provide parking for HGVs and private vehicles, including guest parking.

SQL propose to decommission the existing abstraction borehole located off the access road to facilitate the road realignment on their own lands. SQL propose to undertake periodic extraction of groundwater from an abstraction borehole located on Stresslite Precast Ltd to provide water for SQL's closed-loop system wheelwash recycling tank and the mobile bowser.

There will be no direct discharge to surface or groundwater from the quarry operations. Collected waters from the base of the quarry void will continue to be pumped to the primary soakaway (which is connected to an overflow soakaway). It is proposed that the collect waters will pass through a bypass separator prior to discharge to the primary soakaway. It is proposed to extend the existing sump on the quarry floor to provide additional temporary holding capacity for collected waters, if required.

Following end-of-quarry life, a 2 year restoration period is proposed. This is detailed in a Restoration and Habitats Management Plan provided in appendix 2B of Chapter 2 (Project Description) of this EIAR.

Figure 4-1 - 37L Planning Application Boundary and EIA Boundary

4.2 LEGISLATIVE AND POLICY CONTEXT

This assessment is in compliance with the following legislation and guidance:

4.2.1 LEGISLATION

- EIA Directive;
- EU Water Framework Directive (WFD) 2000/60/EC;
- Planning and Development Act, 2000 (as amended);
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended; hereafter referred to as the Birds and Habitats Regulations);
- EC Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (hereafter referred to as EU Habitats Directive 92/43/EEC;
- EC Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (hereafter referred to as EU Birds Directive (2009/147/EC));
- Wildlife Act, 1976 and Wildlife (Amendment) Act (2000) including all amendments. In this document, the legislation is referred to collectively as the Wildlife Acts (referred to in this report as WA); and
- S.I. No. 356/2015 - Flora (Protection) Order, 2022.

4.2.2 RELEVANT POLICIES AND PLANS

- Ireland's 4th National Biodiversity Action Plan 2023–2030;
- The Kildare County Development Plan 2023–2029 in particular Chapter 12 (Biodiversity and Green Infrastructure). The key policies and objectives of this current plan are listed in the Project Description (Chapter 2);
- The Wicklow County Development Plan 2022-2028, in particular Chapter 17 (Natural Heritage and Biodiversity);
- All-Ireland Pollinator Plan 2021–2025; and
- County Kildare Heritage Plan 2019–2025.

4.2.3 RELEVANT GUIDANCE

- British Standards Institute (2012). BS5837 – Trees in Relation to Construction - Recommendations, BSI, London, UK.
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- Collins, J. (ed) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London.
- DAFM (2022). Nitrates Explanatory Handbook. Department of Agriculture, Food and the Marine.
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- Fossitt, J. (2000) A Guide to Habitats in Ireland. Heritage Council.
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- National Biodiversity Data Centre (n.d.). Irish Vegetation Classification – Division Synopses.
- National Road Authority (2006) (NRA) Guidelines for the treatment of badgers prior to the construction of national road schemes.
- NatureScot standing advice for planning consultations: Red Squirrel. Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels
- NatureScot standing advice for planning consultations: Pine Marten. Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-pine-martens
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- NRA (2009b) Guidelines for Assessment of Ecological Impacts of National Road Schemes. Available at: https://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf
- NPWS (2019a) The Status of EU Protected Habitats and Species in Ireland. Habitat Conservation Assessments (Volume 2). Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS (2019b) The Status of EU Protected Habitats and Species in Ireland. Species Assessments (Volume 3). Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS (2024). Conservation Objectives and Site Synopses of SACs (Special Areas of Conservation), SPAs (Special Protected Areas), NHAs (National Heritage Areas) and pNHAs (proposed National Heritage Areas). Available at: https://www.npws.ie/protected-sites
- OPR Practice Note PN01 (2021) Appropriate Assessment Screening for Development Management. Office of the Planning Regulator.
- Smith, G. F., O'Donoghue, P., O'Hara, K., Delaney, E. (2011). Best Practice and Guidance for Habitat Surveying and Mapping. Heritage Council.
- SNH (2016) Assessing connectivity with SPAs. Version 3 - June 2016.

4.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

The approach to this impact assessment comprises analysis of desk-based and field survey data gathered in 2024 (dates provided in relevant sections below).

Conclusions are drawn as to whether, and to what extent, baseline conditions are likely to change as a result of the proposed activities, and whether these changes represent significant ecological impacts.

4.3.1 DESK STUDY

The aim of the desk study was to identify designated sites/protected areas, irreplaceable/priority[2] habitats and legally protected and notable[3] species that may be present within the Application Site's Ecological Zone of Influence (EZoI)[4], including:

- European sites such as SACs, SPAs, and international Ramsar sites; within **20 km** of the Application Site, based on the upper-range commuting distance of pink-footed and greylag geese (outlined by Scottish Natural Heritage (SNH), 2016);
- NHAs[5] and pNHAs within **5 km** of the Application Site, unless hydrological connectivity exists, in which case these would be considered up to a distance of **15 km**;
- Protected or notable species within **5 km** of the Application Site, limited to records returned from within the last 20 years;
  - This includes bird species listed in Annex I of the EU Birds Directive, and those currently on the Red and Amber list as per Birds of Conservation Concern in Ireland (BoCCI) (Gilbert, et al., 2021);
- The Irish Wetland Bird Survey (I-WeBS) dataset was reviewed to identify I-WeBS survey sites within **2 km** of the Application Site.

The areas indicated above, with respect to the desk study, are collectively referred to as the 'search area'.

Resources used for the desk study included:

- National Parks and Wildlife Services (NPWS) freely available data;
- National Biodiversity Data Centre (NBDC) freely available data;
- NPWS MapViewer for Flora Protection Order (FPO) (2022) protected bryophytes;
- Bing maps (https://www.bing.com/maps/);
- Google Earth;
- EPA maps (https://gis.epa.ie/EPAMaps/);
- 2019 Article 17 Spatial Data (https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17/2019);
- Review of data provided in Chapter 4 (Ecology and Biodiversity) of the 2019 EIAR for the same site (Golder, 2019) (see Appendix 4B); and

[2] Habitats that are considered irreplaceable or listed under Annex I on EU Habitats Directive 92/43/EEC.
[3] Notable species are species considered rare or important/endemic in Ireland. Specifically, if they are categorised as Vulnerable, Endangered or Critically Endangered, Extinct in the Wild, or Extinct as per the International Union for the Conservation of Nature and Natural Resources (IUCN) Red Lists. 'Notable' also refers to invasive species.
[4] The CIEEM EcIA Guidelines define the EZoI as the area over which important ecological features may be subject to significant effects resulting from the Development; this may extend beyond the footprint of the Development. The EZoI may vary for each ecological feature due to the varying mobility range of the feature being assessed. For example, the EZoI for otter (which are mobile) will be greater than the EZoI for habitats (which are sedentary). The EZoI in the context of this project refers to the Study Area, as well as the areas searched during the desk study.
[5] Per the NPWS, the NHA is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection.

- Review of any other relevant ecological reports and literature – cited as necessary.

The freely available desk study results should not be considered definitive datasets for the search area. An absence of records within the desk study data does not necessarily preclude a species from being present on the Application Site.

4.3.2 FIELD SURVEYS

A high-level ecological walkover survey of the Application Site was carried out by WSP, on the 15 August 2024 and 21 October 2024[6]. The study area included the area within the EIA boundary. As previously mentioned, it was not possible to survey a buffer of 50m of the entire proposed quarry extension area due to no access being permitted outside of the EIA boundary. The study area can be viewed in Figure 4-2.

The scope of the surveys included:

- Habitats – in accordance with guidance by Smith et al. (2011) and Fossitt (2000);
- Protected/notable species:
  - Badger – in accordance with NRA (2009). A search was made for signs of badger activity, which included looking for evidence such as sett holes, footprints, latrines, dung pits, hairs and mammal paths with evidence of use by badgers; and
  - Bats – an initial high-level assessment of habitat to determine likelihood that the study area may be used by foraging and/or roosting bats.
  - Other species – hedgehog, Irish hare, pygmy shrew and herpetofauna – incidental observations were recorded of any evidence of these species, with guidance from Olsen (2013);
  - Birds – incidental observations of birds were recorded;
  - The suitability of habitats for the above-mentioned protected species was also recorded.

Badger Sett – Camera Surveys

WSP deployed a trail camera (K&F Concept 48MP UHD) near a potential badger sett at the main soakaway from the 21st of October and the 5th of November 2024, and then from the 5-19 November 2024 (two consecutive two-week periods, in line with guidance from Scottish Badgers (2018). The camera was checked at the end of the first two-week period to swap out batteries and the memory card. All potential sett entrances were visible in camera footage.

Any images or videos captured were then reviewed once the camera had been collected.

Aquatic Ecology

The assessment considers the potential for hydrological connectivity between the Application Site and surface water features in the surrounding area, as well as any potential impacts to aquatic flora/fauna and habitat receptors.

[6] A second field survey was carried out due to there having been limited access to the study area at the time of the first survey.

It is important to note that no watercourses cross the Application Site, and the only waterbodies present are two artificial soakaways.

4.3.3 INVASIVE SPECIES

Unless specified otherwise, the term ‘invasive species’ in this report refers to species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477/2011) and subsequent amendments.

In terms of invasive flora, these regulations make it an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow any of the scheduled plant species. In terms of fauna, the regulations make it an offence for a person to breed, reproduce or release, allow or cause to disperse, or escape from confinement, any of the scheduled animal species.

In addition, ‘invasive’ refers to cherry laurel (*Prunus laurocerasus*) and Canadian pondweed (*Elodea canadensis*), which are not listed in S.I. 477/2011 but are considered a ‘high-impact’ invasive species by the NBDC (2013). Cherry laurel and Canadian pondweed are the only two ‘high-impact’ species not included in S.I. 477/2011.

Figure 4-2 - Field Survey Study Area 2024

4.3.4 LIMITATIONS

Access

As previously mentioned, land access was not possible outside of the EIA boundary. As such, the recommended 50 m buffer of the proposed quarry expansion area could not be fully surveyed.

Access was not possible to the northwestern/western boundary on either survey visit due to health and safety concerns, given the boundary is located along a sheer rock face. Any areas which could not be accessed on foot were instead surveyed using binoculars. It is therefore considered that any access limitations encountered in the field surveys did not preclude gathering sufficient data to carry out a robust impact assessment.

Breeding Birds

A full suite of breeding bird surveys was not carried out. However, incidental sightings during the walkover surveys were recorded.

In the absence of breeding bird data, the precautionary principle has been used to presume that a range of breeding bird species may be present within the study area. Therefore, this does not present a significant limitation to the assessment.

Herpetofauna

The 2024 walkover surveys found that one of the artificial waterbodies present within the Application Boundary has potential suitability for breeding amphibians such as common frog and smooth newt. The use of this habitat by breeding amphibians could not be confirmed due to seasonal constraints (the optimal survey period is Mid-February to May).

WSP has therefore applied the precautionary principle to assume the presence of breeding amphibians in the overflow soakaway – this is to ensure the impact assessment considers a worst-case scenario. In this context, the lack of amphibian survey data does not preclude the completion of a robust impact assessment.

4.3.5 BASELINE EVALUATION CRITERIA OF ECOLOGICAL FEATURES

Ecological features are evaluated following NRA (2009) guidelines (Table 4-1) which set out the importance of the resource/receptor in a geographic site-based context.

Table 4-1 - Criteria for Establishing Important Ecological Features (IEFs)

Importance	Ecological Valuation
International	European Site including SAC, Site of Community Importance (SCI) or SPA Features essential to maintaining the coherence of the European Network[7]. Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level)[8] of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Site (Convention on Wetland of International Importance Especially Waterfowl Habitat, 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). Biosphere Reserve (UNESCO Man & The Biosphere Programme). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988)[9].
National	Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve.

[7] See Article 3 and 10 of the Habitats Directive.
[8] It is suggested that, in general, 1% of the national population of such species qualifies as internationally important. However, a smaller population may qualify as internationally important where the population forms a critical part of the wider population or the species is at a critical phase of its life cycle.
[9] Note that such waters are designated based on these waters' capabilities of supporting salmon, char and whitefish *Coregonus*.

Importance	Ecological Valuation
	Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA). Resident or regularly occurring populations (assessed to be important at the national level)[10] of the following: • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. • Site containing 'viable areas'11 of the habitat types listed in Annex I of the Habitats Directive.
County	Area subject to a Tree Preservation Order. Area of High Amenity[12], or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level)[13] of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or

[10] It is suggested that, in general, 1% of the national population of such species qualifies as nationally important. However, a smaller population may qualify as internationally important where the population forms a critical part of the wider population, or the species is at a critical phase of its life cycle.
[11] A 'viable area' is defined as an area of habitat that, given the particular characteristic of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological process and function) would be maintained in the face of stochastic change (e.g. as a result of climate change).
[12] It should be noted that whilst areas such as Areas of High Amenity and areas subject to a Tree Preservation Order are often designated on the basis of their ecological value, they may also be designated for other reasons such as their amenity or recreational value. Therefore, it should not be automatically assessed that such sites are of county importance from an ecological perspective.
[13] It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of the wider population or the species is at a critical phase of its life cycle.

Importance	Ecological Valuation
	• Species listed on the relevant Red Data list. Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared. Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Importance	Ecological Valuation
Local (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (LBAP) if this has been prepared. Resident or regularly occurring populations (assessed to be important at the Local level)[14] of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; • Species protected under the Wildlife Acts; and/or • Species listed on the relevant Red Data list. Sites containing semi-natural habitat types with the high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality. Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological vale.
Local (lower value)	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. Sites or features containing non-native species that are of some importance in maintaining habitat links.

[14] It is suggested that, in general, 1% of the Local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of the wider population, or the species is at a critical phase of its life cycle.

In accordance with NRA (2009) guidelines, ecological sites of below 'Local Importance (Higher Value)' should not be selected as Important Ecological Features (hereafter 'IEFs') for which impact assessment is required during subsequent stages of the process. Impacts on these features would not be considered significant.

4.3.6 IMPACT ASSESSMENT

The potential for impacts on IEFs has been assessed considering the habitats and species that are likely to be affected by the proposed works. CIEEM (2022) defines an ecologically Significant Effect as *'an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographic area. The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats, and/or the levels of population of the species for which it was classified'*. The following parameters in Table 4-2 are described when characterising impacts (following CIEEM (2022) and NRA (2009) guidance):

Table 4-2 - Methods of Characterising Impacts

Impact	Description
Direct or Indirect	An impact can be caused either as a direct or as an indirect consequence of a Development.
Magnitude	A measurement of the size of an impact, which is described as high, medium, low or negligible.
Extent	The area over which the impact occurs.
Duration	The time for which the impact is expected to last prior to recovery or replacement of the resource or feature: • Temporary: Up to 1 year. • Short Term: The effects would take 1-7 years to be mitigated. • Medium Term: The effects would take 7-15 years to be mitigated. • Long Term: The effects would take15-60 years to be mitigated. • Permanent: The effects would take 60+ years to be mitigated.
Likelihood	Certain/Near Certain: >95% chance as occurring as predicted: • Likely: 50-95% chance as occurring as predicted. • Unlikely: 5-50% chance as occurring as predicted. • Extremely Unlikely: <5% chance as occurring as predicted.

4.3.7 MITIGATION

The approach to mitigation is as set out in the mitigation hierarchy (as per CIEEM (2022)), reproduced in Table 4-3. The principle underlying the mitigation hierarchy is that avoidance is favoured over mitigation, and mitigation is favoured over compensation, which should be viewed as a last resort. Measures for the implementation of biodiversity enhancement should be included regardless of whether avoidance, mitigation or compensation is necessary.

4.3.7.1 Biodiversity Enhancement – Recent Policy

In 2023, Kildare County Development Plan 2023-2029 (Chapter 12) introduced a new objective (BI O7) to "*pursue insofar as possible and practical, a policy of biodiversity net gain through strategies, plans, developments, mitigation measures, appropriate offsetting and/or investment in Blue-Green Infrastructure*".

A new briefing paper has also recently been produced by CIEEM (2024) on the implementation of biodiversity enhancement (BE) in Ireland. Two key takeaways of this paper are that two key points the mitigation hierarchy should always be followed sequentially, with the primary emphasis being on avoidance, and secondly, that large developments (e.g. renewable or infrastructure projects) offer the greatest opportunity to deliver BNG.

Table 4-3 - Mitigation Hierarchy

Stage	Description
Avoidance	Seek options that avoid harm to ecological features (for example, by locating on an alternative site).
Mitigation	Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
Compensation	Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
Enhancement	Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

4.4 BASELINE CONDITIONS

4.4.1 DESK STUDY RESULTS

4.4.1.1 DESIGNATED SITES

Table 4-4 lists 10 no. European sites of nature conservation importance located within the **20 km** EZoI of the EIA boundary - the closest of which to the Application Site is Red Bog SAC, which is located approximately 1.4 km southwest. An Appropriate Assessment Screening Report (AAS) therefore accompanies this application. Figure 4-3 shows the proximity of designated sites to the EIA boundary.

There are no NHAs located within **5 km** of the EIA boundary, with the closest being Hodgestown Bog NHA, located approximately 21.8 km northwest. Table 4-4 also lists four non-statutory designated sites, in this case pNHAs, within **5 km** of the EIA boundary. The nearest is Red Bog, Kildare pNHA which is 1.4km southwest. Given that these pNHAs are also designated as European sites, which carry a higher level of protection, the impact assessment for these sites is covered separately within the AAS which accompanies this application.

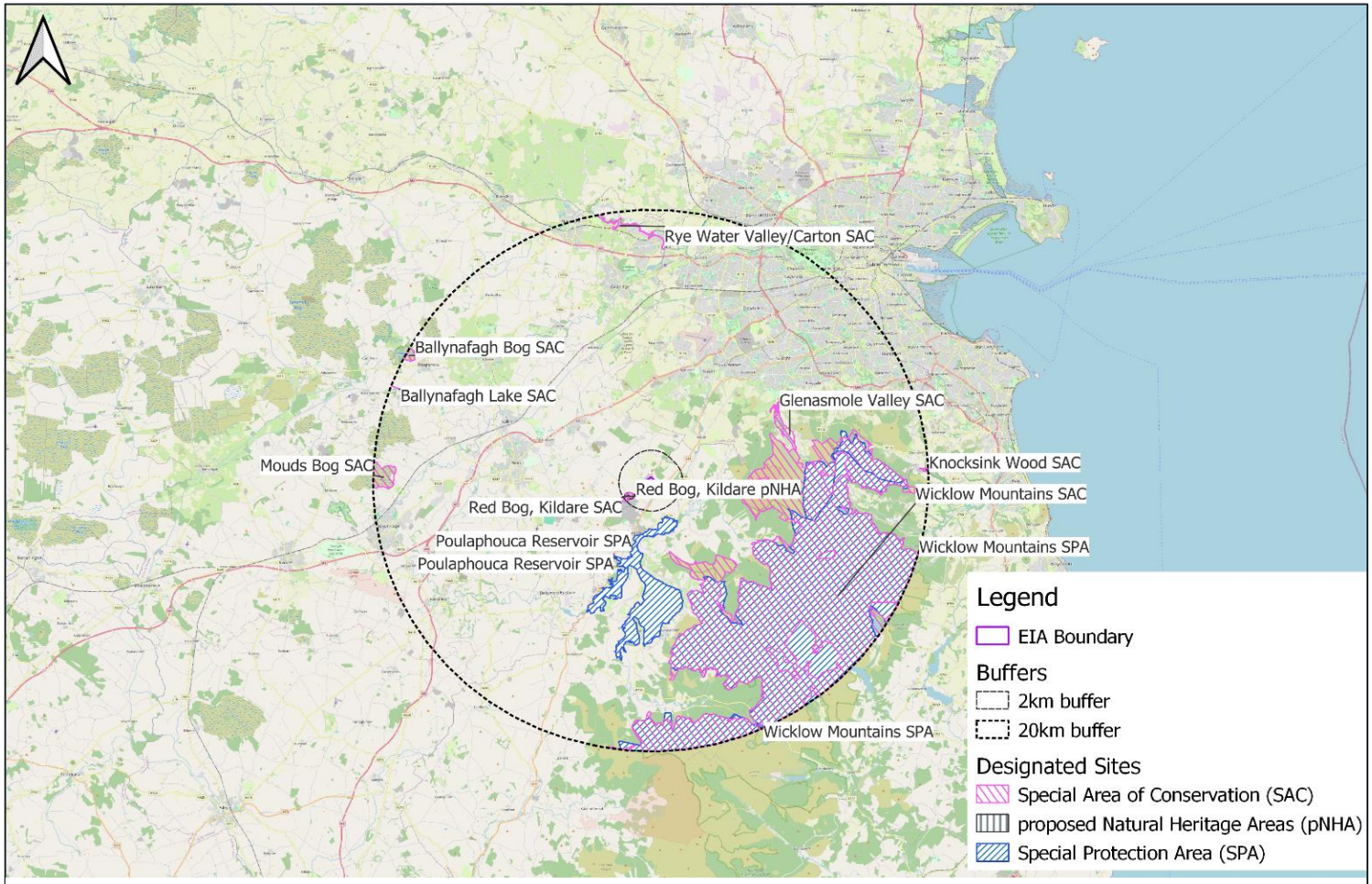

Figure 4-3 - Designated Sites

Table 4-4 - Designated and Notable Sites within the EZoI of the Development

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests (Habitats/Birds Directive Code, where applicable)
Red Bog, Kildare SAC (000397) Red Bog, Kildare pNHA (000397)	1.4km southwest	Section 6.4.11.1 in Chapter 6 (Water) of this EIAR illustrates a conceptual section of the area from the Application Site to Red Bog, and details that due to Red Bog being a perched feature, it is considered **highly unlikely that there is any hydrological connectivity** between the Application Site and Red Bog. The Red Bog SAC boundary is ca. 1.4 km from the Application Site and according to IAQM guidance (2016) the risk of an impact is anticipated to be negligible and therefore unlikely to result in a significant effect. As such, there is thought to be **no functional connectivity for dust emissions**.	• Transition Mires [7140]
Poulaphouca Reservoir SPA (004063) Poulaphouca Reservoir pNHA (000731)	2.6km southeast	The Poulaphouca Reservoir is fed by a number of watercourses, the closest of which to the Application Site being the Goldenhill River (1.13km from the Application Site). Figure 6-21 within Chapter 6 (Water) of this EIAR illustrates potential connectivity between the Application Site and Goldenhill River, and therefore Poulaphouca Reservoir SPA/pNHA. While there is **potential hydrological connectivity** between the Application Site and Poulaphouca Reservoir, through Goldenhill River, Chapter 6 (Water) highlights that "*arsenic levels recorded in the soakaway pond have been highest following dry periods. Over these dry periods, the arsenic concentrates in the quarry sump and soakaway pond due to reduced dilution. There is a lower water level in the soakaway pond and overflow pond, which reduces the potential for drainage through the sands and gravels. Therefore, a hydraulic connection between the soakaway ponds and the*	• Greylag goose [A043] • Lesser black-backed gull *Larus fuscus* [A183]

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests (Habitats/Birds Directive Code, where applicable)
		Goldenhill River is more likely when the water in the soakaways is more dilute..". Chapter 6 concludes that any potential residual impacts on the SPA/pNHA, and Goldenhill River, would be **negligible/imperceptible,** and therefore **not significant**. The qualifying species of this SPA are primarily associated with large bodies of water, which are present within the Application Site in the form of two (albeit relatively small) soakaways (main and overflow). The magnitude of disturbance associated with proposed activities at the Application Site is such that there is no suitable foraging resource for waterfowl. According to the Bird Foraging Table, prepared by the Department of Agriculture, Food and the Marine (DAFM, 2019), projects more than 1 km from an SPA may be screened out for impacts on foraging lesser black-backed gulls, on the grounds that it is further than its established core foraging range. Therefore, there is **no functional connectivity for lesser black-backed gull.** The core foraging range for greylag geese is accepted as being 20 km (SNH, 2016). Greylag goose prefer low-lying agricultural land (BTO, 2023), with key foraging habitats including marshes, grasslands (particularly wet grasslands) and other wetland habitats, cereal stubble, estuaries and lakes. Key forage resources are herbaceous plant materials accessible at ground level in terrestrial areas or from the surface of water bodies, including roots (of rushes and sedges, for example), grasses and other leaves, stems, tubers (such as potatoes), and (spilled) grain (Boland and Crowe, 2008). At Poulaphouca Reservoir SPA, birds have been observed feeding on ryegrass, mustard and winter cereals, as well as	

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests (Habitats/Birds Directive Code, where applicable)
		on a nearby freshwater marsh (Boland and Crowe, 2008). They have been recorded predominantly at Threecastles to the northeast of Blessington Bridge, and also at Mountseskin in southwest County Dublin. Birds were recorded roosting on the reservoir, to the northeast of Blessington Bridge, and feeding on ryegrass/mustard and winter cereals nearby, at three locations around Threecastles, and also on a freshwater marsh situated close to the roost area (Burke *et al*, 2022). No greylag geese were recorded during the 2024 ecological walkover surveys[20]. The Application Site is also located in the uplands, with greylag goose preferring to foraging in the lowlands (see above). It should also be noted that the population of greylag geese has decreased 78% at Poulaphouca SPA between 1999 and 2017 (NPWS, 2024), and 21% throughout Ireland as a whole (Lewis, 2019). As such, the value of Poulaphouca Reservoir as a critical site for greylag geese populations in Ireland has declined, given the population decline is significantly greater than that of Ireland as a whole. As such, it can be concluded with reasonable confidence that there is **no functional connectivity for greylag geese.**	
Kilteel Wood pNHA (1394)	3.1km northwest	**No hydrological connectivity.** This site is proposed as a NHA for the woodland habitat that is present onsite. There is therefore **no functional connectivity** with the Application Site.	• Deciduous woodland
Slade Of Saggart and Crooksling Glen pNHA (000211)	4.7km northeast	**No hydrological connectivity.** This site is proposed as a NHA for the woodland habitat, plant, invertebrate and waterfowl assemblages present. Given that the pNHA is more than 1km from the Application Site, there is **no functional connectivity** for mallard, pochard, teal	• Deciduous woodland • Rare terrestrial (yellow archangel *Lamiastrum galeobdolon* and chalcid *Halticoptera patellana (Hymenoptera)*) and aquatic (shoreweed *Littorella uniflora*) plant assemblage

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests (Habitats/Birds Directive Code, where applicable)
		and tufted duck (in line with relevant guidelines (DAFM, 2020)).	• Rare invertebrate assemblage (species not specified) • Waterfowl assemblage (teal, tufted duck, pochard, mallard)
Wicklow Mountains SAC (002122)	5.2km east	**No hydrological connectivity.** This SAC is designated for habitats only; there is therefore **no functional connectivity** with the Application Site.	• Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] • Natural dystrophic lakes and ponds [3160] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • Calaminarian grasslands of the *Violetalia calaminariae* [6130] • Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] • Blanket bogs (* if active bog) [7130] • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] • Calcareous rocky slopes with chasmophytic vegetation [8210] • Siliceous rocky slopes with chasmophytic vegetation [8220] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • Otter *Lutra lutra* [1355]

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests (Habitats/Birds Directive Code, where applicable)
Wicklow Mountains SPA (004040)	7.9km east	**No hydrological connectivity.** According to SNH (2016), merlin nests are separated by a mean distance of ca. 500m, and a maximum of 1.5km. Peregrine falcon nests are separated by a mean distance of ca. 3km, and a maximum of 6.5km. In a study of Co. Wicklow peregrine populations, Burke *et al*. (2015) found that the mean distance between nests was 5.7km. According to SNH (2016), the core foraging range for merlin is 5km, and 2km for peregrine falcon. As such, the Application Site is outside the core range for which peregrines associated with the SPA may forage. There is therefore **no functional connectivity for foraging or nesting peregrine falcon, or for nesting or foraging merlin.**	• Merlin *falco columbarius* [A098] • Peregrine falcon *Falco peregrinus* [A103]
Glesamole Valley SAC (001209)	9.8km northeast	**No hydrological connectivity.** Petrifying springs are GWDTEs, but this SAC is not in the same groundwater body as the Application Site. There is no groundwater connectivity. This SAC is designated for habitats only; there is therefore **no functional connectivity**.	• Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* (*important orchid sites) [6210] • *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae* [6410] • Petrifying springs with tufa formation (*Cratoneurion*) [7220]
Rye Water Valley/Carton SAC (001398)	17.1km north	**No hydrological connectivity.** Due to having no hydrological connectivity with the Application Site, and the distance between the sites, it is reasonable to conclude that there is **no functional connectivity** between the SAC and the Application Site. This is due to whorl snail's main method of colonisation and dispersal being via waterborne transportation.	• Petrifying springs with tufa formation (Cratoneurion) [7220] • Narrow-mouthed whorl snail *Vertigo angustior* [1014] • Desmoulin's Whorl Snail *Vertigo moulinsiana* [1016]
Mouds Bog SAC	18.4km west	**No hydrological connectivity.**	• Active raised bogs [7110]

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests (Habitats/Birds Directive Code, where applicable)
		This SAC is designated for habitats only; there is therefore **no functional connectivity**.	• Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]
Ballynafagh Bog SAC	19.2km northwest	**No hydrological connectivity.** This SAC is designated for habitats only; there is therefore **no functional connectivity**.	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]
Ballynafagh Lake SAC	19.3km northwest	**No hydrological connectivity.** Alkaline fens are GWDTEs, but this SAC is not in the same groundwater body as the Application Site. There is no groundwater connectivity. Given that there is no hydrological connectivity and given the distance between the SAC and the Application Site, there is therefore **no functional connectivity**.	• Alkaline fens [7230] • Desmoulin's Whorl Snail *Vertigo moulinsiana* [1016] • Marsh Fritillary *Euphydryas aurinia* [1065]
Knocksink Wood SAC	19.5km east	**No hydrological connectivity.** This SAC is designated for habitats only; there is therefore **no functional connectivity**.	• Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]

4.4.1.2 Protected and Notable Species

This section describes the results of the desk study for protected and notable species, the parameters of which are outlined in Section 4.3.1.

Flora

The desk study returned 292 records of conifers, flowering plants, mosses, liverworts, stoneworts, and horsetails. One of these, six-stamened waterwort (*Elatine hexandra*) is listed as Near Threatened on the IUCN Red List (Wyse *et al*., 2016). No other species recorded are afforded any protection.

Field surveys in 2019 did not yield any records of protected or notable flora.

Bats

Historical records show that five bat species have been recorded within **5 km** of the EIA boundary. All Irish bat species are protected under the WA and are listed under Annex IV of the Habitats Directive. Further details are provided in Table 4-5.

During emergence surveys carried out at the (SQL-owned) residential dwelling within the EIA boundary in 2019[15], common and soprano pipistrelle were recorded, as well as Leisler's bat. It should be noted that any bats recorded during this survey did not emerge from the SQL-owned property, but instead were recorded foraging and/or commuting in the vicinity.

Table 4-5 - Desk Study - Bats

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
Brown long-eared bat	*Plecotus auritus*	Habitats Directive - Annex IV Protected Species - Wildlife Acts	NBDC
Leisler's bat	*Nyctalus leisleri*	Habitats Directive - Annex IV Protected Species - Wildlife Acts	2019 emergence survey NBDC
Common pipistrelle	*Pipistrellus pipistrellus*	Habitats Directive - Annex IV Protected Species - Wildlife Acts	2019 emergence survey NBDC
Soprano pipistrelle	*Pipistrellus pygmaeus*	Habitats Directive - Annex IV	2019 EIAR emergence survey

[15] Bat emergence surveys were carried out in 2019 to determine whether or not any bats were roosting within potential roost features (PRFs) on the SQL-owned residential dwelling.

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
		Protected Species - Wildlife Acts	NBDC
Daubenton's bat	*Myotis daubentonii*	Habitats Directive - Annex IV Protected Species - Wildlife Acts	NBDC
Whiskered bat	*Myotis mystacinus*	Habitats Directive - Annex IV Protected Species - Wildlife Acts	NBDC

Birds

A data search of NBDC returned records of 87 bird species within **5km** of the EIA boundary. Of these, 39 are afforded protection under the Birds Directive and/or are listed on the BoCCI Red or Amber list (Gilbert, et al., 2021) – see Table 4-6. All wild birds are protected under the WA.

Additionally, sand martins were recorded within the EIA boundary during a field survey carried out in 2019.

Table 4-6 - Desk Study - Protected and Notable Bird Species

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
Barn owl	*Tyto alba*	Birds of Conservation Concern - Red List	NBDC
Barn swallow	*Hirundo rustica*	Birds of Conservation Concern - Amber List	NBDC
Black-headed gull	*Larus ridibundus*	Birds of Conservation Concern - Amber List	NBDC
Goldeneye	*Bucephala clangula*	EU Birds Directive Annex II Section II Birds of Conservation Concern - Red List	NBDC
Kestrel	*Falco tinnunculus*	Birds of Conservation Concern – Red List	NBDC
Kingfisher	*Alcedo atthis*	EU Birds Directive Annex I Birds of Conservation Concern - Amber List	NBDC
Common linnet	*Carduelis cannabina*	Birds of Conservation Concern - Amber List	NBDC
Pheasant[16]	*Phasianus colchicus*	EU Birds Directive Annex II, Section I EU Birds Directive Annex III, Section I Bird Species	NBDC
Redshank	*Tringa totanus*	Birds of Conservation Concern - Red List	NBDC
Snipe	*Gallinago gallinago*	EU Birds Directive Annex II, Section I EU Birds Directive Annex III, Section III	NBDC

[16] Pheasant does not fulfil 'notable' criteria but has been retained in the table given that it is a ground-nesting species and may be relevant in this case.

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
		Birds of Conservation Concern – Red List	
Starling	*Sturnus vulgaris*	Birds of Conservation Concern - Amber List	NBDC
Swift	*Apus apus*	Birds of Conservation Concern - Red List	NBDC
Woodpigeon	*Columba palumbus*	EU Birds Directive Annex II/III	NBDC
Curlew	*Numenius arquata*	EU Birds Directive Annex II Section II Bird Species Birds of Conservation Concern - Red List	NBDC
Eurasian teal	*Anas crecca*	EU Birds Directive Annex II/III Section II Bird Species Birds of Conservation Concern - Amber List	NBDC
Eurasian golden plover	*Pluvialis apricaria*	EU Birds Directive Annex I Bird Species, Annex II, Section II Annex III, Section III Birds of Conservation Concern - Red List	NBDC
Goosander	*Mergus merganser*	EU Birds Directive Annex II, Section II Bird Species Birds of Conservation Concern - Amber List	NBDC
Great cormorant	*Phalacrocorax carbo*	Birds of Conservation Concern - Amber List	NBDC
Greater White-fronted Goose	*Anser albifrons*	EU Birds Directive Annex I Bird Species EU Birds Directive Annex II, Section II Bird Species EU Birds Directive Annex III, Section III Bird Species Birds of Conservation Concern - Amber List	NBDC
Greylag goose	*Anser anser*	Invasive Species Regulation S.I. 477 (Ireland)	NBDC

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
		EU Birds Directive Annex II, Section I Bird Species EU Birds Directive Annex III, Section II Bird Species Birds of Conservation Concern - Amber List	
House martin	*Delichon urbicum*	Birds of Conservation Concern - Amber List	NBDC
House sparrow	*Passer domesticus*	Birds of Conservation Concern - Amber List	NBDC
Jack snipe	*Lymnocryptes minimus*	EU Birds Directive Annex II, Section I Bird Species EU Birds Directive Annex III, Section III Bird Species	NBDC
Lesser black-backed gull	*Larus fuscus*	Birds of Conservation Concern - Amber List	NBDC
Lapwing	*Vallenus vallenus*	EU Birds Directive Annex II, Section II Bird Species Birds of Conservation Concern - Red List	NBDC
Little egret	*Egretta garzetta*	EU Birds Directive Annex I Bird Species	NBDC
Mallard	*Anas platyrhynchos*	EU Birds Directive Annex II, Section I Bird Species EU Birds Directive Annex III, Section I Bird Species	NBDC
Mute swan	*Cygnus olor*	Birds of Conservation Concern - Amber List	NBDC
Northern shoveler	*Spatula clypeata*	EU Birds Directive Annex II, Section I Bird Species EU Birds Directive Annex III, Section III Bird Species Birds of Conservation Concern - Red List	NBDC
Northern wheatear	*Oenanthe oenanthe*	Birds of Conservation Concern - Amber List	NBDC
Red kite	*Milvus milvus*	Birds of Conservation Concern – Red List	NBDC

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
Rock pigeon	*Columba livia*	EU Birds Directive Annex II, Section I Bird Species	NBDC
Sand martin	*Riparia riparia*	Birds of Conservation Concern - Amber List	2019 field survey NBDC
Skylark	*Alauda arvensis*	Birds of Conservation Concern - Amber List	NBDC
Spotted flycatcher	*Muscicapa striata*	Birds of Conservation Concern - Amber List	NBDC
Yellowhammer	*Emberiza citrinella*	Birds of Conservation Concern - Red List	NBDC

A review of the Irish Wetland Bird Survey (I-WeBS) dataset found that there are no I-WeBS survey sites within **2km** of the EIA boundary, with the nearest being located at Poulaphouca Reservoir ca. 2.9km to the southeast of the Site.

Mammals

The desk study returned records of 19 mammal species within **5km** of the EIA boundary. Of these, eight are afforded protection under the Habitats Directive and/or the WA – see Table 4-7**.**

The field survey carried out by Golder in 2019 did not record any protected/notable mammal species within the EIA boundary.

Table 4-7 - Desk Study - Mammals

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
Eurasian pygmy shrew	*Sorex minutus*	Protected Species - Wildlife Acts	NBDC
Otter	*Lutra lutra*	Habitats Directive - Annex II/IV Protected Species - Wildlife Acts	NBDC NPWS
Pine marten	*Martes martes*	Habitats Directive - Annex II/IV Protected Species - Wildlife Acts	NBDC NPWS
Red squirrel	*Sciurus vulgaris*	Protected Species - Wildlife Acts	NBDC
Eurasian badger	*Meles meles*	Protected Species - Wildlife Acts	NBDC
Red deer	*Cervus elaphus*	Protected Species - Wildlife Acts	NBDC
Irish hare	*Lepus timidus hibernicus*	Protected Species - Wildlife Acts	NBDC NPWS
Irish stoat	*Mustela erminea subsp. hibernica*	Protected Species - Wildlife Acts	NBDC

Herpetofauna

The desk study returned three records of herpetofauna within **5km** of the EIA boundary; common frog (*Rana temporaria*), common lizard (*Zootoca vivipara*), and smooth newt (*Lissotriton vulgaris*). All herpetofauna are protected under the WA. Common frog is listed under Annex V of the Habitats Directive.

No records of herpetofauna were recorded during the 2019 field survey.

Invertebrates

The desk study returned 421 invertebrate species within **5km** of the EIA boundary. Of these, 12 were listed on the IUCN Red List as at least Near Threatened (see Table 4-8).

No records of invertebrates were returned by the 2019 field survey.

Table 4-8 - Desk Study – Protected and Notable Invertebrate Species

Common Name	Scientific Name	Designation and/or Conservation Status	Source of Record
Dingy skipper (water beetle)	*Erynnis tages*	Red List Status: Near threatened	NBDC
Small heath butterfly	*Coenonympha pamphilus*	Red List Status: Near threatened	NBDC
Wall butterfly	*Lasiommata megera*	Red List Status: Near threatened	NBDC
Scarce emerald dragonfly	*Lestes dryas*	Red List Status: Near threatened	NBDC
Painted Mining Bee	*Andrena (Andrena) fucata*	Red List Status: Near threatened	NBDC
Sandpit Mining Bee	*Andrena (Leucandrena) barbilabris*	Red List Status: Near threatened	NBDC
Buffish Mining Bee	*Andrena (Melandrena) nigroaenea*	Red List Status: Vulnerable	NBDC
Gooden's Nomad Bee	*Nomada goodeniana*	Red List Status: Endangered	NBDC
Bronze Furrow Bee	*Halictus (Seladonia) tumulorum*	Red List Status: Near threatened	NBDC
Large red-tailed bumblebee	*Bombus (Melanobombus) lapidarius*	Red List Status: Near threatened	NBDC
Willoughy's Leafcutter Bee	*Megachile (Delomegachile) willughbiella*	Red List Status: Near threatened	NBDC
Moss carder-bee	*Bombus (Thoracombus) muscorum*	Red List Status: Near threatened	NBDC

Invasive Species

Records of Japanese knotweed (*Reynoutria japonica*), a legally-designated invasive as per SI 477/2011, were returned by the data search. Records for cherry laurel (*Prunus laurocerasus*) were also returned, however, cherry laurel is not a designated invasive species as per SI 477/2011, but is considered a 'high-impact' invasive species by the National Biodiversity Data Centre (NBDC, 2013). Records for both species were from within **5km** of the EIA boundary.

Records of four mammal species that are designated as invasive under S.I. 477/2011 were also returned by the data search – American mink *Mustela vison*, brown rat *Rattus norvegicus*, sika deer *Cervus nippon Muntiacus reevius*, and grey squirrel *Sciurus carolinensis*.

There were no records of invasive species recorded during the 2019 field survey.

Other Species

Several other species records were returned by the data search within **5km** of the EIA boundary (from both NBDC and NPWS data). These included six species of crustacean and 25 molluscs. One of these species, freshwater white-clawed crayfish (*Austropotamobius pallipes*), is protected under the WA, and is listed in Annex II/V of the EU Habitats Directive.

4.4.2 FIELD SURVEY RESULTS

This section presents the results of the field surveys carried out on the 15th of August and 21st of October 2024. Photographs taken during the surveys are presented in Appendix 4A. Methodology used is detailed in Section 4.3.2.

4.4.2.1 Habitats and Flora

Habitats recorded within the study area are discussed below. Habitat nomenclature is in accordance with Fossitt (2000).

Distribution of these habitats across the study area is illustrated in Figure 4-4. Images of each habitat type are presented in Appendix 4A.

Buildings and artificial surfaces (BL3)

One building, a residential property owned by SQL (which was occupied at the time of survey), and associated hardstanding and access route were recorded adjacent to the quarry footprint. No other BL3 habitat was recorded.

Exposed sand, gravel or till (ED1)

Gravel was recorded at the entrance to the active quarry and along the route to an area which has been used for temporary stockpiling. These areas were devoid of any plant species. Due to ongoing quarry activities in this area (stockpiling, HGV movement), there is limited opportunity for plants to colonise.

Recolonising bare ground (ED3)

Recolonising bare ground was recorded northeast and south of the existing quarry pit. A small linear parcel was also recorded along the eastern EIA boundary, and in the southeast of the study area. This habitat comprised gorse (*Ulex europaeus*), buddleja (*Buddleja davidii*), hawthorn (*Crataegus monogyna*), common nettle (*Urtica dioica*),

ragwort (*Senecio jacobaea*), common dandelion (*Taraxacum officinale*), cat's ear (*Hypochaeris radicata*), rosebay willowherb, colt's foot (*Tussilago farfara*), lesser celandine (*Ficaria verna*), and storksbill (*Erodium cicutarium*). Species diversity was relatively low.

Active quarries and mines (ED4)

Bare ground associated with ongoing quarry activities was the dominant habitat type recorded in the northwest of the study area. This habitat type is inherently almost completely devoid of any plant species due to high levels of disturbance by general quarry works.

Other artificial lakes and ponds (FL8)

Two artificial soakaways were recorded to the southwest of the study area. No plant species were recorded in association with the larger main soakaway; however, some partial vegetation coverage was recorded in the smaller overflow soakaway.

Improved agricultural grassland (GA1)

The east/southeast of the study area was dominated by agricultural grassland. Species included *Plantago sp.*, broad-leaved dock (*Rumex obtusifolius*), sorrel (*Rumex acetosa*), ragwort, *Ranunculus sp*. and white clover (*Trifolium repens*).

Dry meadows and grassy verges (GS2)

The periphery of the largest parcel of agricultural grassland was recorded as dry meadows and grassy verges. This was due to the marked difference in sward height (taller grasses recorded here when compared with the area of agricultural grassland), and a greater abundance of herbs such as sorrel, broad-leaved dock, common vetch (*Vicia sativa*), *Ranunculus sp*., *Plantago sp.*, ragwort, and common nettle. Buddleja and gorse were also recorded.

Continuous scrub (WS1)

Two parcels of continuous scrub were recorded. The parcel in the most southeasterly point of the study area comprised willow (*Salix sp*.), gorse, buddleja, and hawthorn scrub. The other parcel, which lined part of the northwestern EIA boundary, comprising gorse, hawthorn and spruce (*Picea sp.*).

Hedgerow (WL1)/Treeline (WL2)

A hedgerow was recorded along the northeastern boundary of the study area. Species included willow, buddleja, and gorse.

At the entrance to the quarry, a hedgerow/treeline was recorded which included the species cherry laurel, spruce, rowan (Sorbus aucuparia) and buddleja.

A Leyland cypress (Cupressus x leylandii) treeline was also recorded surrounding the SQL-owned residential property.

Invasive Species

One invasive plant species, cherry laurel (a 'high-impact' invasive species, as per NBDC (2013) was recorded. Cherry laurel was recorded in the area of hedgerow along the entrance to the existing quarry.

Images of each habitat type recorded are presented in Appendix 4A. Distribution of habitats across the study area is illustrated in Figure 4-4.

Figure 4-4 - Habitat Distribution

4.4.2.2 Fauna

This section provides the results of field surveys carried out in 2024, in relation to protected/notable fauna. The methodology adhered to is detailed in Section 4.3.2. Figure 4-5 illustrates any evidence of protected/notable fauna (referred to as 'field signs') that were recorded during field surveys. The sections below discuss each species in detail.

Bats

Suitable foraging habitat for bats exists in the form of hedgerows and scrub within the study area. No potential roosting features were recorded. Ongoing disturbance within the quarry void (blasting most notably, but also rock crushing and screening, and miscellaneous movements of plant and machinery around the quarry) is considered preclusive to the establishment of bat roosts in the quarry walls.

There is potential for the SQL-owned property to support roosting bats. The 2019 field survey carried out by Golder (see Appendix 4B) also noted that this building had

suitability for roosting bats. A subsequent emergence survey carried out by Golder ultimately did not confirm the presence of any roosting bats. It was noted that the property was in occupation at the time of the 2024 survey.

Badger

Two potential setts were recorded within the study area. One was located above the parking area to the southwest of the study area on a steep slope. This potential sett had four entrances. Due to the location near the top of a sub-vertical slope, it was not possible for the surveyors to get close enough to conduct a full assessment and as such, in line with the precautionary principle, it is assumed that the feature is a potential sett that is used by badgers[17].

The other potential sett was recorded adjacent to the primary soakaway (see Appendix 4A, TN8). Although a full assessment was not possible due to health and safety concerns[18], mammal footprints were noted on the ground. This potential sett also had four entrances. Camera trapping of the 4 entrances of this potential sett was undertaken by WSP.

Camera Footage

No images or videos of badger movements were captured. In the initial two-week deployment, a fox and a domestic cat were recorded outside the potential sett entrances. During the subsequent two weeks, the camera was triggered once by a deer.

In advance of the initial camera deployment, it was noted that a thin layer of debris in the form of rubble/loose stone material had been accidentally deposited over three of the four potential sett entrances. WSP notified SQL, who removed the debris immediately. There was no evidence of any structural damage to any of the tunnels.

Whilst two consecutive fortnights of no badger activity is ordinarily sufficient to confirm non-use of a sett by badgers (Scottish Badgers, 2018), the disturbance of this feature in this fashion creates some uncertainty regarding whether lack of badger activity is a result of the disturbance.

Small Mammals

Areas of hedgerow/treeline and continuous scrub are suitable for other protected and/or notable fauna including pygmy shrew, hedgehog and Irish hare, although no specific evidence of these was recorded during the field survey.

Herpetofauna

No common lizards were recorded during the field survey. However, this species may inhabit any area where suitable basking conditions are present e.g. rock or sand (The

[17] No images are available of this potential sett, as it was observed through binoculars at a distance.
[18] It was noted by the surveyor that the potential sett was located behind a fence, above the waters' edge and as such it could not be accessed at close range.

Herpetological Society of Ireland, 2015), and where there is nearby cover to evade predators. As such, the areas of exposed rock within the study area are considered suitable habitat for common lizard, as well as hedgerows and scrub which provide cover/refuge. Additionally, suitable refuge is present to the north of the quarry pit in the form of discarded/old tyres.

The overflow soakaway was found to have suitability for breeding amphibians, owing to the fact that it was partially vegetated at the time of the survey.

Birds

Several areas across the study area were determined to be suitable for a variety of nesting and/or foraging bird species. The walls of the quarry pit were found to be suitable for breeding raptors such as kestrel and peregrine falcon. Further, a sand martin colony of approximately 25 nest holes was recorded in the sandy face above the main soakaway. Additionally, the presence of scrub and hedgerow along the EIA boundaries, and recolonising bare ground (mostly in the north/northeast) provides suitable nesting and foraging habitat for a range of bird species, including species which were returned by the desk study e.g. linnet and yellowhammer.

Aquatic Fauna

The two aquatic features found within the study area have no connectivity with the wider hydrological network. As a result, it is considered unlikely that the study area could support fish species or otter.

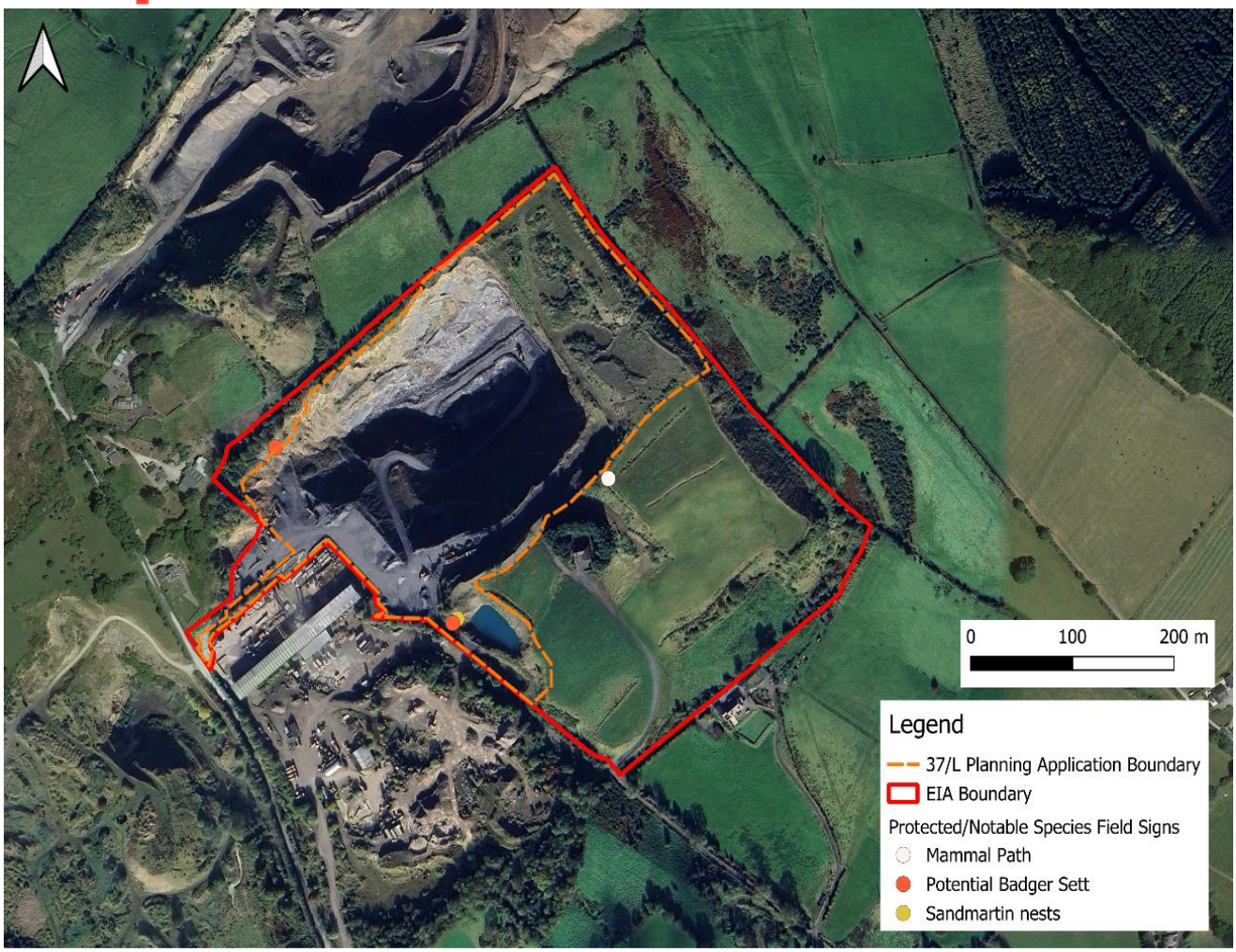

Figure 4-5 - Protected/Notable Species Field Signs

4.5 EVALUATION OF ECOLOGICAL FEATURES

Table 4-9 provides an evaluation of IEFs (Important Ecological Features) identified following a review of existing ecological baseline information provided above, in line with criteria set out in Table 4-1. Reasons for inclusion or omission of IEFs is also detailed in Table 4-9. Only designated and notable sites deemed to have connectivity with the Application Site (see Table 4-4) have been evaluated. In this case, no connectivity has been established with any designated or notable sites.

Further, in accordance with NRA (2009) guidelines, only IEFs deemed of to be of Local Importance (Higher Value) or above have been taken to the assessment stage.

Table 4-9 - Evaluation of Ecological Features

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
Habitats			
Buildings and artificial surfaces (BL3)	One building and associated hardstanding/access route was recorded within the study area. This building was said to be of moderate suitability for roosting bats in 2019. The building and associated hardstanding/access will not be directly impacted by proposed works, nor will any works be within 20m of it (Bat Conservation Trust, n.d.).	Local Importance (Lower Value)	No
Exposed sand, gravel or till (ED1)	This habitat is directly associated with anthropogenic disturbance and is not mentioned in the County Development Plans or Local BAPS.	Local Importance (Lower Value)	No

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
Recolonising bare ground (ED3)	Recolonising bare ground is the first stage in ecological succession, after bare ground begins to experience colonisation by ruderal flora. While this habitat type is not mentioned within the local BAPs or the County Development Plan, it was noted during the 2024 walkover surveys that in the context of the Application Site, this habitat type may provide suitable habitat for some ground-nesting birds e.g. ringed plover. Recolonising bare ground is not considered to be an IEF in itself. **Impacts to ground-nesting birds are covered separately.*	Local importance (Lower Value)	No
Active quarries and mines (ED4)	This habitat is directly linked to disturbance and has no associated vegetation cover. Further, there is no reference to this habitat in the local BAPs or the County Development Plan. **Impacts to birds (i.e. sand martins and peregrine falcons) are covered separately.*	Local Importance (Lower Value)	No
Artificial Lakes and Ponds (FL8)	These are inherently artificial habitats and are in use as part of ongoing operations at the Application Site. Their value for amphibians is addressed separately.	Local Importance (Lower Value)	No

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
Improved agricultural grassland (GA1)	This habitat is not considered as ecologically valuable as other habitats present within the study area. It has low floral diversity and is usually associated with pastoral agriculture. This habitat type is not listed in the local BAPs. While species such as greylag goose (associated with Poulaphouca Reservoir SAC) forage on agricultural grasslands, they tend to prefer lowland habitats, where roots (of rushes and sedges, for example), grasses and other leaves, stems, tubers (such as potatoes), and (spilled) grain (Boland and Crowe, 2008), are accessible to forage. Greylag geese are deemed to be of medium sensitivity to disturbance, with a buffer zone (for pedestrian disturbance) of 200-600m recommended (Goodship and Furness, 2022). Given that there are active quarry works ongoing less than 100m from the areas of improved grassland, it is considered that disturbance levels are too high for the lands to be considered suitable for greylag geese.	Local Importance (Lower Value)	No
Dry meadows and grassy verges (GS2)	A small amount of dry meadows and grassy verges were recorded on the periphery of large parcels of improved grasslands to the east of the active quarry pit. This habitat type is not mentioned in either the Kildare or Wicklow County Development Plan.. The GS2 habitat recorded within the EIA boundary is of low species diversity, consisting of common ruderal species such as buttercup and docks. This example of this habitat type is common and widespread on unmanaged lands nationwide and is therefore not considered to be high value.	Local Importance (Lower Value)	No
Continuous scrub (WS1)	Scrub habitat was recorded along part of the west-to-north EIA boundary, and in the southernmost corner of the EIA boundary. In areas with little/no woodland, scrub is an important alternative habitat for species that would otherwise utilise woodland.	Local Importance (Higher Value)	Yes

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
	Scrub is not specifically mentioned in local BAPs or the County Development Plans. It lacks the status of a 'wildlife corridor' that is afforded to hedgerows. However, it is a resource for breeding birds (potentially BoCCI), terrestrial mammals and foraging bats.		
Hedgerow (WL1)/Treeline (WL2)	In areas with little/no woodland, hedgerows and treelines are important alternative habitats for species that would otherwise utilise woodland. Hedgerows were recorded near the entrance to the active quarry, and along part of the north-to-east EIA boundary. It should be noted that the hedgerow at the entrance is partially composed of cherry laurel, an invasive species. A treeline was also recorded partially-surrounding the SQL-owned property. The importance of hedgerows is acknowledged in local BAPs and the County Development Plan. Though they may not be designated sites, the significance of such features is recognised by the EU Habitats Directive (92/43/EEC), which obliges member states to maintain them to improve the ecological coherence of the Natura 2000 network. Whilst the presence of cherry laurel diminishes the ecological value of this habitat somewhat, the overall importance of hedgerows, in the context of the Site as a whole, has been deemed local-high and is considered an IEF.	Local Importance (Higher Value)	Yes
Protected Species			
Breeding birds	The study area has some habitats that are suitable for breeding birds. Sand martin (Amber, BoCCI) has been confirmed to nest within the study area. Considering the number of nesting burrows noted (25), it is not considered that breeding sand martins within the study area meet the criteria for county-level importance. All nesting birds are protected under the WA, which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs.	Local importance (Higher Value)	Yes

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
Wintering birds	There is no suitable habitat for wintering birds within the study area. The Appropriate Assessment Screening report, submitted with this application, concluded that the potential impacts of noise and habitat loss would not result in significant effects to foraging greylag geese associated with Poulaphouca Reservoir SPA. This conclusion has therefore been extended to other species of wintering avifauna that may forage on grassland around the periphery of the Application Site but which roost elsewhere.	Local Importance (Lower Value)	No
Bats	Suitable foraging habitat for bats was recorded within the study area in the form of hedgerows and scrub. The SQL-owned property may also be suitable for roosting bats[20]. All bat species are protected under the WA and are mentioned the in the Kildare County Development Plan.	Local Importance (Higher Value)	Yes
Badgers	Two potential badger setts were recorded within the study area. Badgers are afforded protection under the WA.	Local Importance (Higher Value)	Yes

[20] As noted previously, it was not possible to confirm whether potential roost features were available at the property in 2024. Survey data from 2019 indicate that the property provided several potential roost features, although none of these were in use.

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
Amphibians	Suitable breeding habitat for amphibians (common frog and smooth newt) has been recorded in one of the artificial waterbodies within the study area. Common frogs and smooth newts are protected under the WA.	Local Importance (Higher Value)	Yes
Reptiles	Areas of exposed rock and bare ground are found within the study area, providing suitable basking habitat for common lizard. Records of common lizard were also returned by the desk study and therefore presence within the study area has been assumed. Common lizard is protected under the WA.	Local Importance (Higher Value)	Yes
Terrestrial invertebrates	The recolonising bare ground habitat that will be lost in the expansion of the existing quarry pit is of limited value to terrestrial invertebrates due to there being limited species diversity. The notable species found in the desk study are mostly generalists, with the exception of the scarce emerald dragonfly, which prefers dense vegetation in shallow, still pools and/or ditches, the sandpit mining bee, which is strongly associated with sandy habitats (not present within the study area), and the moss carder bee, which prefers coastal meadows, dune systems, unimproved grassland, limestone pavement, damp meadows, heathland and bogland margin (Beckett, 2020). As such, it is considered that the study area does not provide important habitat for protected/notable invertebrate species.	Local Importance (Lower Value)	No
Rare flora	The desk study did not return any records of rare flora. Neither the 2019 or 2024 field surveys returned any records of rare flora.	Local Importance (Lower Value)	No
Protected/notable small mammals	Pygmy shrew, otter, pine marten, red squirrel, hedgehog, red deer and Irish hare were recorded in the desk study.	Local Importance	Yes

Ecological Feature	Summary Description / Justification for Inclusion or Omission	Evaluation[19]	Important Ecological Feature (IEF)
	The study area contains limited amounts of suitable habitat for pygmy shrew, hedgehog, and Irish hare, all of which are protected under the WA.	(Higher Value)	
Invasive species	Presence of cherry laurel has been confirmed within the study area. Records of Japanese knotweed were returned by the desk study (but this species was not recorded during field surveys). Further, records of invasive mammal species including brown rat, American mink, grey squirrel and sika deer were also returned by the desk study. Invasive species are mentioned in the County Development Plan.	Local Importance (Higher Value)	Yes

4.6 IMPACT ASSESSMENT

This section aims to quantify the ecological impacts of the proposed works at the Application Site, with reference to the ecological evaluation shown in Table 4-10. Assessment of impacts is in accordance with the methodology described in Section 4.3.6.

4.6.1 DESCRIPTION OF PROPOSED WORKS

A summary description of proposed development is provided in Section 4.1.1. A full project description is provided in Chapter 2 (Project Description) of this EIAR.

4.6.2 CONSIDERATION OF ECOLOGICAL IMPACTS – RATIONALE

Considering the nature of the proposed works at the Application Site, potential impacts have been considered in relation to groundwater, dust, vibration and noise emissions, as well as habitat loss and potential spread of invasive species. Where relevant, information has been obtained from other relevant chapters of this EIAR, namely Chapter 6 (Water), Chapter 7 (Air Quality), and Chapter 9 (Noise and Vibration). Further detail is provided in the relevant subsections below.

4.6.2.1 Water – Surface and Ground

Based on the information presented in Chapter 6 (Water), proposed works at the Application Site will not result in deleterious emissions to groundwater or surface water.

4.6.2.2 Dust

Based on the information presented in Chapter 7 (Air Quality), proposed works at the Application Site will not result in deleterious air quality emissions.

4.6.2.3 Noise and Vibration

Noise

The Waterbird Disturbance Mitigation Toolkit (Cutts *et al.*, 2013) acknowledges that noise emissions below 55 dB are unlikely to cause a response in waterbirds. The noise impact assessment, as presented in Chapter 9 (Noise and Vibration), predicted that noise emissions would not exceed 55 dB at any of the noise-sensitive receptors around the periphery of the Application Site. Considering this information, it is concluded proposed works would not result in significant changes to current noise emissions at the Application Site.

Vibration

Based on the information presented in Chapter 9 (Noise and Vibration), proposed works at the Application Site will not result in deleterious vibration emissions.

4.6.2.4 Habitat Loss and Invasive Species

Impacts relating to habitat loss and invasive species are detailed in Table 4-10.

There will also be a small loss of dry grassland and grassy verges (GS2), ca. 0.02ha in total. This represents a very small percentage of the total amount of this habitat available within the EIA boundary (ca. 2%). GS2 is not classified as an IEF. Approximately 1.9 ha of recolonising bare ground (ED3) is also to be lost to facilitate expansion of the extraction area. The recolonising bare ground within the Application Site is not deemed to be an IEF. See Table 4-9 for further information on both these habitat types.

4.6.3 ASSESSMENT OF IMPACTS

Table 4-10 lists potential impacts (in the absence of mitigation) on IEFs that have been identified in Table 4-9. Impact assessment is based on the methodology outlined in Section 4.3. It is noted that restoration is included as part of the proposed works, but for the purpose of impact assessment, impacts are considered in the absence of mitigation to appropriately inform the Restoration and Habitat Management Plan. Appropriate Assessment Screening screened out impacts on any designated sites. There is considered to be no connectivity with any designated or notable sites, as per the information presented in Table 4-4. As such, no designated or notable sites have been taken through to the impact assessment stage.

Table 4-10 - Potential Impacts on Habitats and Species deemed IEFs

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Habitats				
Continuous scrub (WS1)	Local Importance (Higher Value)	Habitat loss	There will be no loss of this habitat type.	No Impact.
Hedgerow (WD1)/Treeline (WD2)	Local Importance (Higher Value)	Habitat loss – hedgerow along section of north-eastern EIA boundary.	A total of ca. 297 m^2 (ca. 54m in length) of hedgerow would be lost along the northeastern boundary to facilitate expansion of the quarry to the northeast. Species include willow, gorse and buddleja. It should be noted that this does not constitute complete removal, but rather thinning of the existing width, such that a hedgerow will still remain along the property boundary.	Direct, medium magnitude, certain, long term, negative impact. **Significant at local scale.**
		Habitat loss – hedgerow (comprised partly of cherry laurel, an invasive species) at entrance to existing active quarry.	A total of ca. 362 m^2 (ca. 85m in length) of semi-mature spruce hedgerow/treeline would be lost at the existing entrance to the active quarry as a result of the proposed works, to facilitate re-alignment of the quarry entrance route. This hedgerow also incorporates a small amount of cherry laurel (an invasive species).	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**
Species				

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Breeding birds	Local Importance (Higher Value)	Disturbance during the breeding season. Direct kills and/or destruction of nests.	It can be reasonably assumed that hedgerows, treelines, and scrub are at least partially utilised by breeding birds. Ground-nesting species are generally less common than arboreal-nesting species, but they are assumed to be present in this context in the absence of survey data. The existing sand martin nesting site will be unaffected by the proposed works. The unmitigated removal of suitable nesting habitat poses the following risks to breeding birds: • Disturbance of active nests; • Destruction of active nests; and • Direct mortality of individuals.	Direct, medium magnitude, certain, permanent, negative impact. **Significant at local scale.**
		Loss of breeding habitat.	The loss of hedgerows, treelines, scrub and recolonising bare ground represents the loss of suitable nesting habitat for a variety of breeding birds.	Direct, medium magnitude, certain, permanent, negative impact. **Significant at local scale.**
Bats	Local Importance (Higher Value)	Loss of commuting and foraging habitat.	The loss of hedgerows/treelines represents the loss of suitable foraging and/or commuting habitat for bats.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**
Badgers	Local Importance (Higher Value)	Loss of suitable foraging	Loss of hedgerow/treeline habitat along the northeastern EIA boundary (to facilitate further quarrying) will result in the loss of suitable foraging and/or sett building habitat. The amount of	Direct, low magnitude, certain,

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
		and/or sett building habitat.	suitable habitat lost is relatively small (297 m^2), when consideration is given to the abundance of this type of habitat in the surrounding area. The hedgerow/treeline along the access track to the active quarry is also to be removed to allow for realignment of the access road, however, this habitat is not considered suitable for foraging or sett building due to the high-level of disturbance on a daily basis (i.e. vehicular movement). Additional suitable habitat within the EIA boundary, such as scrub near the southeastern and western periphery of the EIA boundary and in the southernmost corner, is to be retained.	permanent negative impact. **Significant at local scale.**
		Disturbance of setts and/or direct kills.	NRA (2006) guidelines state that no works should occur within 50m of active setts during the breeding season (December to June), with this distance extending to 150m for blasting. It should be reiterated that it is not known if the potential setts are active. Outside the breeding season, NRA (2006) states that no heavy machinery should be used within 30m of badger setts (unless carried out under licence); lighter machinery (generally wheeled vehicles) should not be used within 20m of a sett entrance, and light work, such as digging by hand or scrub clearance should not take place within 10m of sett entrances. The proposed new carparking area will be 80m+ from both potential badger setts. The proposed temporary stockpiling areas will be at least 50m from the potential badger setts. In line with the guidelines discussed above, this is considered a sufficient distance to prevent any significant change in disturbance levels to badgers which may use the sett. The movement of HGVs and other plant/machinery along haul routes within the existing quarry, will not represent a shift in baseline conditions. Benching is to be carried out beneath the potential badger sett north of the existing carpark. This will not cause any significant change in current disturbance levels from vibration or noise, given	No Impact.

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
			that the potential sett is already immediately adjacent to ongoing quarry works. Benching works will occur ca. 40m below the potential sett, which is considered to be sufficient distance to prevent disturbance, given that no blasting will occur within 150m of this potential sett. These proposed works would also not impact the commuting route of any badgers utilising the potential sett, which most likely is along the top of the quarry face,[21] which will be unaffected by the proposed works.	
Amphibians	Local Importance (Higher Value)	Loss of breeding habitat.	No works are proposed in or adjacent to the existing soakaways. Suitable breeding habitat identified within the EIA boundary will therefore **not** be lost as a result of proposed works. The installation of an AquaTreat system bypass separator will result in better water quality in the soakaways.	Indirect, low magnitude, certain, permanent, **positive** impact. **Not Significant**
Reptiles	Local Importance (Higher Value)	Loss of refuge habitat.	Refugia in the form of disused tyres were recorded in the proposed quarry extension area during the field survey. This habitat would be lost as a result of the proposed works.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**

[21] It is not considered possible that badgers could access the potential sett from the area which is to be subject to benching, because the quarry wall in between is almost completely vertical.

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Protected/notable small mammals	Local Importance (Higher Value)	Loss of suitable habitat.	Hedgerows, treelines, and continuous scrub represent suitable resting, commuting and foraging habitat for pygmy shrew, hedgehog, and Irish hare. 659 m^2 of hedgerow/treeline will be lost as a result of proposed works. No continuous scrub will be lost.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**
Invasive species	Local Importance (Higher Value)	Spread of invasive species to/from the Application Site, leading to deterioration of habitat condition.	Cherry laurel, an invasive flora species, was recorded at the entrance to the existing quarry. Proposed works will involve the removal of a small amount of cherry laurel (as part of the removal of a mixed species hedgerow), to facilitate realignment of the access road[22]. While cherry laurel is not a legally designated invasive species, it is deemed 'high impact' by NBDC. If left untouched, the cherry laurel may spread via suckering (new shoots sprouting from lateral roots) and/or sexual reproduction. Whilst the removal of cherry laurel from the Application Site is an objectively positive outcome, if it is not correctly carried out, it may mean that roots are left in the ground which can then regrow.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**

[22] It should be noted that not all cherry laurel within the Application Site will be removed as part of the proposed works.

4.7 MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES

The objective of this section is to explore potential mitigation options, to any significant impacts deemed to have the potential to occur as a result of proposed works at the Application Site. For each significant impact identified in Table 4-10, mitigation, compensation and/or enhancement is proposed.

Proposed measures have been considered with reference to the mitigation hierarchy (see Table 4-3). Following the implementation of mitigation, compensation and/or enhancement, each impact is re-assessed to ascertain whether residual impacts remain, and to what extent these are significant. The results of this exercise are presented in Table 4-11, and additional detail is provided in the following subsections.

4.7.1 STANDARD OPERATIONAL MITIGATION MEASURES

Proposed embedded mitigation measures will be adopted to avoid potential impacts to the water environment during proposed works. These are detailed in Chapter 6 (Water), in Section 6.6.2.

4.7.2 HABITATS

A Restoration and Habitat Management Plan (HMP) (see Chapter 2 Project Description, Appendix 2B) has been prepared, which proposes the creation of new habitats following the cessation of the proposed works at the Application Site. The Restoration and Habitat Management Plan also includes for the diversification of species assemblages (i.e. a range of native species will be selected to be added to the Application Site).

4.7.3 BREEDING BIRDS

The clearance of woody vegetation (hedgerows and treelines) will not occur during the breeding season. If this is unavoidable, an ecologist must survey all areas where works are proposed on suitable nesting habitat and check for active nests before operations commence. If present, species-specific avoidance zones will be implemented and adhered to until any chicks have fledged, or the nest is deemed to be no longer in use.

Areas of recolonising bare ground that overlap with the proposed quarry extension area, or with where temporary overburden stockpiles are proposed, will also be checked for active nests that may be present on the ground, prior to any disturbance (if disturbance falls within the breeding season).

In the event that disturbance of active nests cannot be avoided, an ecologist will need to apply for a derogation licence from the NPWS and submit a proposal to relocate the nest and its occupants to a suitable alternative location. It should be noted that the NPWS may refuse such an application if it is deemed that the disturbance of the nest is unnecessary and/or alternative solutions are available.

The Restoration and Habitat Management Plan (see Chapter 2, Appendix 2B) includes proposals to replace at least an equivalent quantity of woody habitat and recolonising bare ground, such that there will be no net loss of breeding habitat. The HMP also includes for the provision of bird boxes in 6 locations around the Application Site.

4.7.4 BATS

As detailed in Section 4.7.2, any woody vegetation that is lost as a result of the proposed works will be replaced so as to ensure no net loss of suitable foraging and/or commuting habitat. Foraging habitat will be enhanced through increased species diversity within hedgerows/treelines which are planted to replace those lost. Native species alder and hazel will be planted. Bat boxes will be fixed to suitably-mature trees along in 6 locations around the Application Site to enhance available roosting habitat for bats.

4.7.5 BADGERS

Any suitable foraging and/or sett building habitat that will be lost will be replaced like-for-like (as a minimum) in a suitable location within the EIA boundary. As previously detailed, species assemblage will be enhanced and will include species recorded in the hedgerow/treeline that is to be lost, as well as additional native species..

4.7.6 REPTILES (COMMON LIZARD)

Existing tyre rubble and additional refugia (see following section for further detail) will be moved from the proposed quarry expansion area to a nearby suitable location (within the EIA boundary) approximately two weeks prior to commencement of quarry expansion works – the aim being to encourage reptiles away from the area for which proposed works are to take place, and into safe, suitable habitat nearby (NatureScot, 2024).

The Restoration and Habitat Management Plan includes the provision of suitable refugia for reptiles, to compensate for the tyre rubble in the north of the Application Site that will be lost as a result of the proposed works. Further details are available in Chapter 2, Appendix 2B of this EIAR. The area of suitable habitat which will be installed will exceed the amount lost and will be placed in appropriate locations – i.e. near to open areas suitable for basking (JNCC, 2004). Refugia will comprise the existing disused tyres found on the Application Site (which will be moved to another suitable location), and rock piles which will be created using boulders from the quarry.

4.7.7 PROTECTED/NOTABLE SMALL MAMMALS

Any woody vegetation lost due to the proposed works will be replaced elsewhere within the EIA boundary (please refer to Chapter 2, Appendix 2B of this EIAR). This will therefore compensate for any loss of suitable habitat.

4.7.8 INVASIVE SPECIES - FLORA

Cherry laurel, which was recorded along the entrance to the Application Site, is to be removed as part of the proposed works, to facilitate realignment of the access road. Removal will be in line with guidance set out by Maguire *et al.* (2008). Specifically, in the event that any root systems are not removed, these will be treated with a glyphosate product (Roundup or similar). Any woody vegetation that is cut must be removed from Application Site with an appropriately authorised waste haulier, to an appropriately authorised waste facility.

It should be noted that cherry laurel does not form new specimens from fragmentation like some other invasive flora (e.g. Japanese knotweed, which can regrow from rhizome fragments as small as 1 cm). Earthworks on or near the plant therefore do not pose risks of regrowth.

4.8 RESIDUAL EFFECTS

Table 4-11 - Mitigation, Compensation, Enhancement and Residual Impacts

Important Ecological Feature (IEF)	Potential Effects Identified	Potential Impacts and Scale	Mitigation, Compensation, and Enhancement	Residual Impacts
Habitats				
Hedgerow/Treeline	Habitat loss – hedgerow along northeastern EIA boundary.	Direct, medium magnitude, certain, permanent, negative impact. **Significant at local scale.**	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	Direct, medium magnitude, certain, **temporary** negative impact. **Not Significant.**
	Habitat loss – hedgerow (comprised partly of cherry laurel, an invasive species) at entrance to existing active quarry.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan. Adherence to relevant guidelines for removal of cherry laurel.	Direct, low magnitude, certain, **temporary** negative impact. **Not Significant.**
Species				
Breeding birds	Disturbance during the breeding season. Direct kills and/or destruction of nests.	Direct, medium magnitude, likely, permanent, negative impact. **Significant at local scale.**	Avoidance of suitable habitat during breeding season where possible. Checks of suitable habitat by an ecologist prior to removal as necessary	**No Impact.**

Important Ecological Feature (IEF)	Potential Effects Identified	Potential Impacts and Scale	Mitigation, Compensation, and Enhancement	Residual Impacts
			during the breeding season.	
	Loss of breeding habitat.	Direct, medium magnitude, certain, permanent, negative impact. **Significant at local scale.**	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	Direct, medium magnitude, certain, **temporary** negative impact. **Not Significant.**
Bats	Loss of commuting and foraging habitat.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	Direct, low magnitude, certain, **temporary** negative impact. **Not Significant.**
Badgers	Loss of suitable foraging and/or sett building habitat.	Direct, low magnitude, permanent certainnegative impact. **Significant at local scale.**	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	Direct, low magnitude, certain, **temporary** negative impact. **Not Significant.**
Reptiles	Loss of refuge habitat.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**	Relocation of existing refugia to elsewhere on the Application Site, prior to commencement of proposed works. Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	**No Impact.**

Important Ecological Feature (IEF)	Potential Effects Identified	Potential Impacts and Scale	Mitigation, Compensation, and Enhancement	Residual Impacts
Protected/notable small mammals	Loss of suitable habitat.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**	Habitat compensation and enhancement, as per Restoration and Habitat Management Plan.	Direct, low magnitude, certain, **temporary** negative impact. **Not Significant.**
Invasive Species - Flora	Spread of invasive species to/from the Application Site, leading to deterioration of habitat condition.	Direct, low magnitude, certain, permanent, negative impact. **Significant at local scale.**	Following appropriate biosecurity measures and guidelines relating to the removal of invasive species (cherry laurel specifically).	Direct, low magnitude, **unlikely**, permanent negative impact. **Not Significant.**

4.9 CUMULATIVE EFFECTS

The cumulative effects associated with other permitted / under construction third-party developments have been considered in Chapter 15 of this EIAR. Cumulative effects are considered to be **Not Significant**.

4.10 SUMMARY AND CONCLUSIONS

The Application Site has been assessed for it's potential to result in significant impacts to important ecological features (IEFs). The impact assessment has examined survey data gathered in 2024. Aerial imagery and environmental emissions monitoring data have also been used to inform conclusions as to the types of impacts likely to occur from the proposed development.

It was found that significant impacts can potentially occur from habitat loss and the spread of invasive species. Water, dust and noise monitoring assessment indicates that these emissions will not result in significant impacts to IEFs.

Mitigation, compensation and enhancement measures have been proposed in the form of reinstatement of habitats through a Restoration and Habitat Management Plan, adherence to biosecurity guidelines, and pre-works checks of suitable nesting habitats which are to be lost. The implementation of these measures will result in the identified impacts being either negated or reduced to an insignificant impact. No other impacts were identified, from the Application Site alone, nor cumulatively with other plans or projects.

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Appendix 4A

TARGET NOTES FROM FIELD SURVEYS 2024

Target Noteuo	Description	Photograph
TN1	Improved agricultural grassland (GA1)	 

TN2	Continuous scrub (WS1)		

		
TN3	Adjacent cement manufacturers	

TN4	Recolonising bare ground (ED3) on northern extent of pit	 
TN5	Area of ED3 dominated by buddleja to northern extent of Application Site	

		

TN6	Existing carpark within an area of Exposed Sand, Gravel or Till (ED1)	 

TN7	Crusher within an area of ED1	

TN8	Potential badger sett at the main soakaway.	

TN9	Sand martin nest holes at the main soakaway.	

TN10	Disused machinery within an area of ED1	 

	Quarry pit – mapped as ED1	
TN11	Eastern boundary	

TN12	Entrance drive	

TN13	SQL-owned property mapped as Buildings and artificial structures (BL3) and surrounding Leyland cypress (mapped as WL2)	 

TN14	Mammal path through an area of Dry meadows and grassy verges (GS2) in the western corner of the restored eastern field	
TN15	Mounds within an area of ED3	

		
TN16	Main soakaway – mapped as Other Artificial Lakes and Ponds (FL8)	

TN17	Northern extent of pit	

TN18	Restored field (east). Photo shows GA1, GS2 and ED3 habitat.	 

TN19	Restored field drain	

TN20	Restored field (south). Photo shows GA1 and GS2.	  

TN21	Restored field(southeast).	

TN22	Restored field (southwest).	

TN23	Site office	

TN24	Overflow soakaway	

TN25	Tyre rubble to northern extent of quarry pit	

TN26	Western drain in restored grassland	

TN27	Wheel wash and existing carpark	

TN28	Drone image showing a hedgerow/line of trees at the Application Site entranced, mapped as WL1 (hedgerow) / WL2 (treeline).	

Appendix 4B

GOLDER (2019) EIAR – ECOLOGY AND BIODIVERSITY

4.0 ECOLOGY AND BIODIVERSITY

4.1 Introduction

4.1.1 Scope

This assessment presents a summary of ecological features which are, or have the potential to be, ecological constraints to the proposed development (the proposed development is described in Chapter 2.0). This chapter evaluates the importance of the ecological resources present and defines the degree of significance of potential impacts resulting from the proposed development. The report also identifies appropriate mitigation measures and defines residual impacts.

A Natura Impact statement (NIS) has been produced and is included in the application. This report concludes that no significant impacts would occur to Natura 2000 sites as a result of the proposed development.

4.2 Policy and legislation context

This section addresses the legislation and guidance that has been considered when preparing this chapter, and key policy context relevant to biodiversity.

4.2.1 Legislation

- The Planning & Development Act 2000 & the Planning and Development (Amendment) Act, 2010 (as amended) hereafter referred to as the Planning Acts;
- The Wildlife Act 1976 as amended by the Wildlife (Amendment) Act, 2000 (as amended) hereafter referred to as the Wildlife Acts;
- The EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU), the Planning and Development Acts 2000-2018, and the Planning and Development Regulations, 2001-2018;
- European Communities (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018);
- European Commission (EC) Habitats Directive 92/43/EEC (as amended);
- EC Birds Directive 2009/147/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) hereafter referred to as the Birds and Habitats Regulations;
- Flora (Protection) Order, 2015;
- Environment (Miscellaneous Provisions) Act 2011;
- The Fisheries (Consolidation) Act 1959; and
- The Local Government (Water Pollution) Act, 1977 (as amended by Sections 3 and 24 of the 1990 Act.).

4.2.2 Relevant Policies and Plans

- National Biodiversity Plan, 2017-2021;
- Ireland's National Strategy for Plant Conservation;
- Kildare County Development Plan 2017-2023;
- County Kildare Biodiversity Plan 2009 – 2014;
- All Ireland Pollinator Plan 2015 – 2020; and

- County Kildare Heritage Plan 2019 – 2025.

4.2.3 Relevant Guidance

- Invasive Species in Ireland (NPWS, 2004);
- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater and Coastal Environments (CIEEM, 3rd Edition 2018);
- Circular Letter PL 1/2017 - Implementation of Directive 2014/52/EU on the Effects of Certain Public and Private Projects on the Environment (EIA Directive), 15 May 2017;
- Key Issues Consultation Paper - Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems, 2 May 2017;
- Environmental Impact Assessment of Projects - Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU). European Commission of the European Union 2017;
- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002);
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Draft, Environmental Protect Agency, 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government, 2018);
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009a);
- NRA Environmental Assessment and Construction Series Guidelines (NRA, 2006- 2009);
- Good Practice Guidelines for Householders; Biodiversity and Development in County Kildare (Kildare County Council);
- Good Practice Guidelines for Developers; Biodiversity and Development in County Kildare (Kildare County Council);
- A Guide to Habitats in Ireland. (Fossitt, 2000);
- Bat Surveys: Good Practice Guidelines (Collins, 2016);
- Bat Mitigation Guidelines for Ireland, Irish Wildlife Manuals No. 25 (Kelleher & Marnell, 2006); and
- Bats & Lighting Guidance Notes for Planners, engineers, architects and developers (Bat Conservation Ireland, December 2010).

4.3 Assessment methodology and significance criteria

4.3.1 Desktop survey

A desktop review was conducted of available published and unpublished information, including a review of data available on the National Parks and Wildlife Services (NPWS) and National Biodiversity web-based databases, in order to identify key habitats and species that may be present, in particular those protected by legislation. In order to assess the likely current status of species in the vicinity of the site, the search included a radius of 5 km around the site boundary and was limited to records returned from within the last 20 years.

4.3.2 Designated nature conservation site assessment

Sites of international importance, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are collectively known as Natura 2000 sites. These sites contain examples of some of the most important natural and semi-natural ecosystems in Europe. Designated sites, which also include Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) were also searched for. The designated search area was 15 km from the site boundary for Natura 2000 sites, and 5 km from the site boundary for NHA and pNHA sites.

In the subsequent analysis of designated sites, particular attention was given to potential for the development to influence a designated site. In other words, potential ecological pathways were identified; these pathways can be hydrological, physically overlapping or exhibiting habitat and species synergies that could result in temporary or residual effects being afforded to a designated site.

4.3.3 Ecological survey

Habitats

A walkover survey of the area (JNCC Phase I) was conducted by Golder on 22nd May and 14th August 2019 to record the habitats and flora in the area within and adjacent to the development site, and to detect the presence or likely presence of protected species, and the presence of suitable habitat for those species. The study was also concerned with identifying the need for further, more specialist surveys as applicable.

Ecological Survey methods were in general accordance with those outlined in the following documents:

- Heritage Council (2011). Best Practice Guidance for Habitat Survey and Mapping;
- Phase 1 Habitat Survey methodology (Joint Nature Conservation Committee (JNCC), 1990, revised 2010); and
- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).

Aerial photographs and site maps assisted the habitat survey. Habitats have been named and described following Fossitt (2000).

The survey also aimed to identify any invasive species which may occur on the site. However, this type of survey is not designed to replace specialist knowledge of invasive species recognition or eradication which should be undertaken by specialist contractors.

Fauna

Bats

Bat survey work at the site was based upon guidance set out within ‘Bat Mitigation Guidelines for Ireland’ (Kelleher & Marnell, 2006), and ‘Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes’ (NRA, 2006), with reference to good practice guidelines set out by the Bat Conservation Trust (Collins, 2016).

Visual examination

Visual inspections for bat roosting potential were carried out on 22nd May and 14th August 2019 in order to search for any features of bat roosting potential in buildings or trees. Inspections were carried out within daylight hours, using binoculars where necessary. Examples of the type of features searched for is outlined below:

- **Buildings.** Presence or absence of loft voids; lifted or missing tiles; gaps in barge boards or soffit boxes; any lifted lead flashing; gaps or cracks in brickwork/mortar; and any other potential crevices.

- **Trees.** Split limbs; rot holes; woodpecker holes; lifted bark; cracks; and dense or mature ivy cover. Where trees were of a size and age that features could be present out of site, these were also recorded.
- **Evidence of Bats.** Evidence for the presence of bats themselves was also searched for, such as live or dead bats, any audio cues, scratch marks, urine staining, prey remains or droppings.

Based on these factors, an assessment was made of whether the Site might support bats, and the type and number of roosts that might be present. Buildings and trees were then assigned a level of bat roosting potential, based upon guidance set out by the Bat Conservation Trust (Collins, 2016) (Table 4-1)

Table 4-1: Guidelines for assessing the potential suitability of buildings and trees for roosting bats (Collins, 2016)

Suitability	Description
Negligible	Negligible features likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions, and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roosting features, but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat, but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis, and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Emergence survey work

Dusk emergence survey work was carried out on 14th August 2019. Surveys were conducted by two surveyors who are experienced in the use of bat detectors, and are familiar with undertaking this type of work. Echometer Touch (EMT) 2, and EMT 2 Pro detectors were used to record bat echolocation, and these recordings were subsequently analysed using Analook and Kaleidoscope software. Details of survey timings and weather conditions are given in Table 4.2, and the surveyor locations are shown in Figure 4.1.

Table 4-2: Emergence survey details

Date	Survey timings	Weather Conditions			
		Wind (BF*)	Temp (°C)	Cloud cover (%)	Precipitation
14.08.19	20:42 – 22:27 Sunset: 20:57	2	16-17	0	Dry

* BF = Beaufort Scale

Figure 4-1: Bat survey work; surveyor locations

4.3.4 Survey constraints or limitations

Habitats

It is acknowledged that due to the seasonality of various floral species, not all species will be apparent at any one time in the year. However, the habitat survey was carried out in the optimal season for such work, and accordingly it is considered that the survey work undertaken is sufficient to assign broad habitat types, and assess their relative value in the local setting.

Invasive Species

Throughout survey work the opportunity was taken to record the presence of any invasive non-native species. However, the detectability of such species can vary throughout the year and depending on their life stage or recent management. In addition (as outlined above), this type of survey is not designed to replace specialist knowledge of invasive species recognition which should be undertaken by specialist contractors. Accordingly, absence of an invasive non-native species should not be assumed even if it was not recorded during the survey work. Equally, where the presence of any invasive non-native species has been identified, absence in the remainder of the site should not be assumed.

Access

Access into some areas at the site periphery was limited due impenetrable scrub, and health and safety restrictions associated with the active quarry footprint, whilst a small field located within the south-east of the site was not accessed in full, albeit an assessment was possible from the periphery of the field. Accordingly, these areas of the site were not subject to detailed survey, whilst this also limited investigations for evidence of fauna (such as Badger), roosting bat potential of trees, assessment of ditches, or invasive species.

Nevertheless, the visible areas of habitat were subject to survey, and allowed an assessment of the likely character of the habitats in these areas and their relative potential to support faunal species. Accordingly, it is considered that the survey work undertaken is sufficient to inform this assessment.

4.3.5 Impact assessment method

Habitats and species were assessed in accordance with the guidance contained in the document *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland* (CIEEM, 2018) which recommends that the value of an ecological resource be determined within a defined geographical context (Figure 4.2).

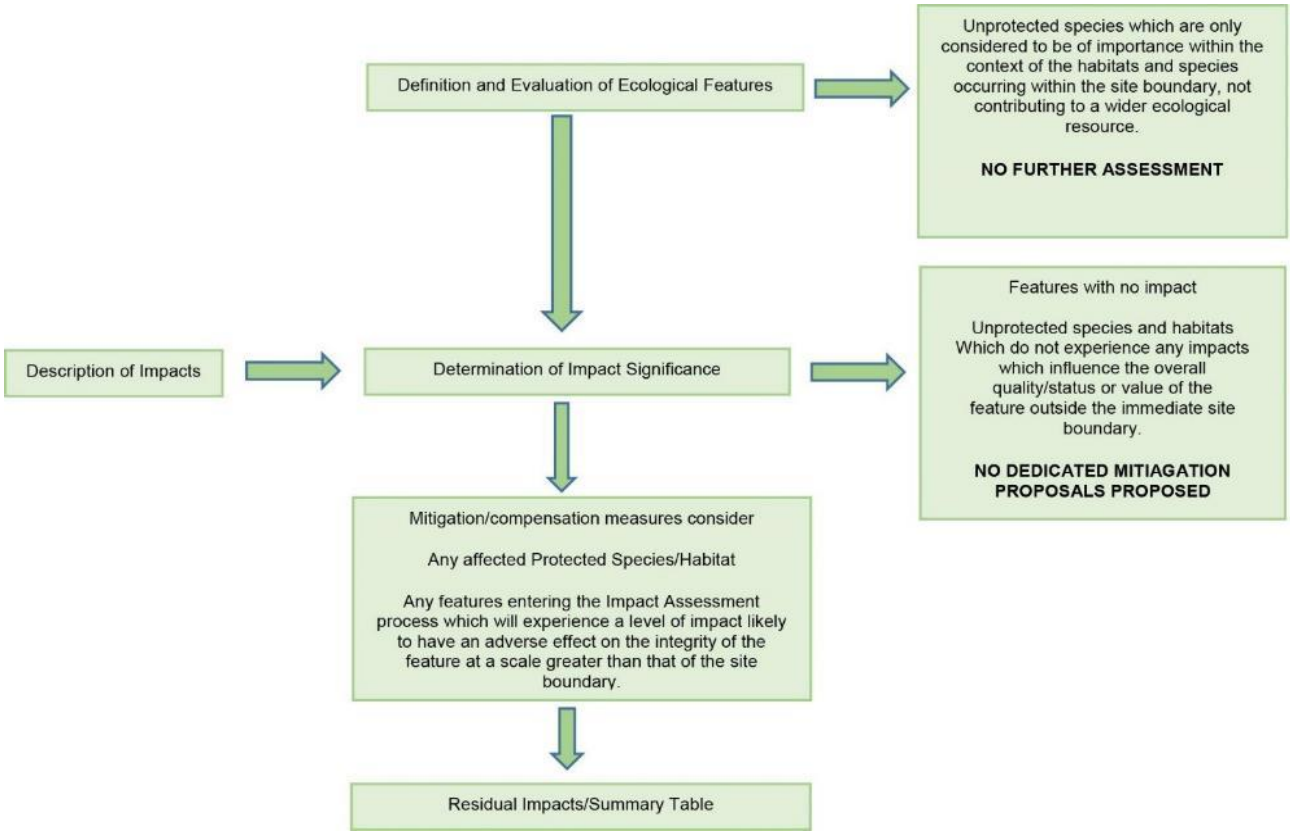

Figure 4-2: Impact Assessment Method

Defining Importance

The relative importance of each ecological feature has been defined on a geographical scale, from international importance, to having relevance only in the context of the site boundary. The definitions employed for the basis of the evaluation are presented in Table 4.3. It should be noted that professional judgement has been employed in the allocation of a level of importance to each feature **as it occurs on the site**. In other words, the value of the feature is presented in the context of its actual status within the site. **Therefore, a single individual of a species which is protected under the European Union (EU) Habitats Directive would not automatically be considered to be of European (international) Importance, but would be evaluated in the context of its relationship to the overall population and conservation status**.

Defining Impact

The impacts to ecological features are defined by their geographical significance in terms of the likely effect and the defined importance of the feature being affected. It is not possible in this system to have an impact greater than the overall geographical importance of the feature (e.g. the maximum possible impact to a feature of a

regional importance would be one which is of regional significance). Impacts which do not have significance beyond the immediate area (the site) will be managed through the implementation of construction and habitat management plans. One exception to this is the case of impacts on Protected Species, where **any** impact would result in the implementation of mitigation measures.

Defining Magnitude of Change

Considering the potential for impacts as defined above, an assessment of the magnitude of change is arrived at. This is based on the table below, and relies on professional subjective judgement in deciding the level of magnitude of change.

Table 4-3: Criteria for Assessing Magnitude of Change

Impact Level	Description
Severe Impact	Ecological effects of a scale or magnitude which would result in permanent, total loss of an irreplaceable species or habitat of international or national importance (occasionally of local importance), or which would result in the substantial loss of a protected/rare habitat or a population of a protected/rare species. They represent key factors in the decision-making process. Typically, mitigation measures would be unlikely to remove such effects.
Major Impact	These effects are likely to relate to permanent impacts at a regional or local level, or temporary impacts at an international or national level, and could be potential concerns to the project depending upon the relative importance attached to the issue during the decision making process. The effects are likely to be large in scale or magnitude, and result in substantial medium term loss of protected/rare species or habitats. Mitigation and detailed design work are unlikely to entirely eliminate all ecological effects.
Moderate Impact	These effects are usually only at local or regional level, and may be short or medium term only, or temporary impacts on a small part of an international site. However, the cumulative effects of such issues may lead to an increase in the overall effect on ecological features. They represent issues where effects will be experienced, but mitigation measures and detailed design work may ameliorate/enhance some of the consequences upon affected interests, but some residual effects will still arise.
Minor Impact	These effects are likely to be local issues only; or small magnitude impacts at the regional and national level, they are usually temporary, and are unlikely to be of importance in the decision making process. However, they are of relevance in enhancing the subsequent design of the development and consideration of mitigation measures.
Not Significant / No Impact	No perceivable impacts on ecological features (habitat or species). Impacts may be beneath levels of perception, within normal bounds of variation, within the margin of forecasting error, or impacting on exceptionally poor baseline conditions.
Beneficial / Positive Impact	These effects are those, which through implementation, would be anticipated to benefit the ecology of the site. They may advance the objectives of local, national or international species or habitats.

Outlining mitigation, compensation, and enhancement measures

Receptors subject to significant impacts (those which have the potential to affect the ecological resource outside of the immediate site boundary) are the focus of provision of mitigation measures which have been formulated according to the mitigation hierarchy (avoid, reduce / minimise, compensate). All proposed mitigation measures follow industry best practice. Those for protected species follow the prescribed regulatory protocols.

Defining residual impact

Following the application of mitigation measures, impacts to each ecological feature are reassessed, and any residual impacts are reported.

As stated by Chartered Institute of Ecology and Environmental Management CIEEM guidance (2018), '*The importance of an ecological feature should be considered within a defined geographical context*'. Accordingly, each feature has been assessed based on the scale described in Table 4.4.

Table 4-4: Criteria for Establishing Receptor Sensitivity/Importance

Importance	Ecological Valuation
International	Sites, habitats or species protected under international legislation e.g. Habitats and Species Directive. These include, amongst others: SAC's, SPA's, Ramsar sites, Biosphere Reserves, including sites proposed for designation, plus undesignated sites that support populations of internationally important species.
National	Sites, habitats or species protected under national legislation e.g. Wildlife Act 1976 and amendments. Sites include designated and proposed NHAs, Statutory Nature Reserves, National Parks, plus areas supporting resident or regularly occurring populations of species of national importance (e.g. 1% national population) protected under the Wildlife Acts, and rare (Red Data List) species.
Regional	Sites, habitats or species which may have regional importance, but which are not protected under legislation (although Local Plans may specifically identify them) e.g. viable areas or populations of Regional Biodiversity Action Plan habitats or species.
Local/County	Areas supporting resident or regularly occurring populations of protected and red data listed-species of county importance (e.g. 1% of county population), Areas containing Annex I habitats not of international/national importance, County important populations of species of habitats identified in county plans, Areas of special amenity or subject to tree protection constraints.
Local	Areas supporting resident or regularly occurring populations of protected and red data listed-species of local importance (e.g. 1% of local population), Undesignated sites or features which enhance or enrich the local area, sites containing viable area or populations of local Biodiversity Plan habitats or species, local Red Data List species etc.
Site	Very low importance and rarity. Ecological feature of no significant value beyond the Site boundary.

4.4 Baseline results

4.4.1 Desk study

Designated Nature Conservation Sites

A map displaying the designated nature conservation sites in the vicinity of the Site is shown at Figure 4.3 below.

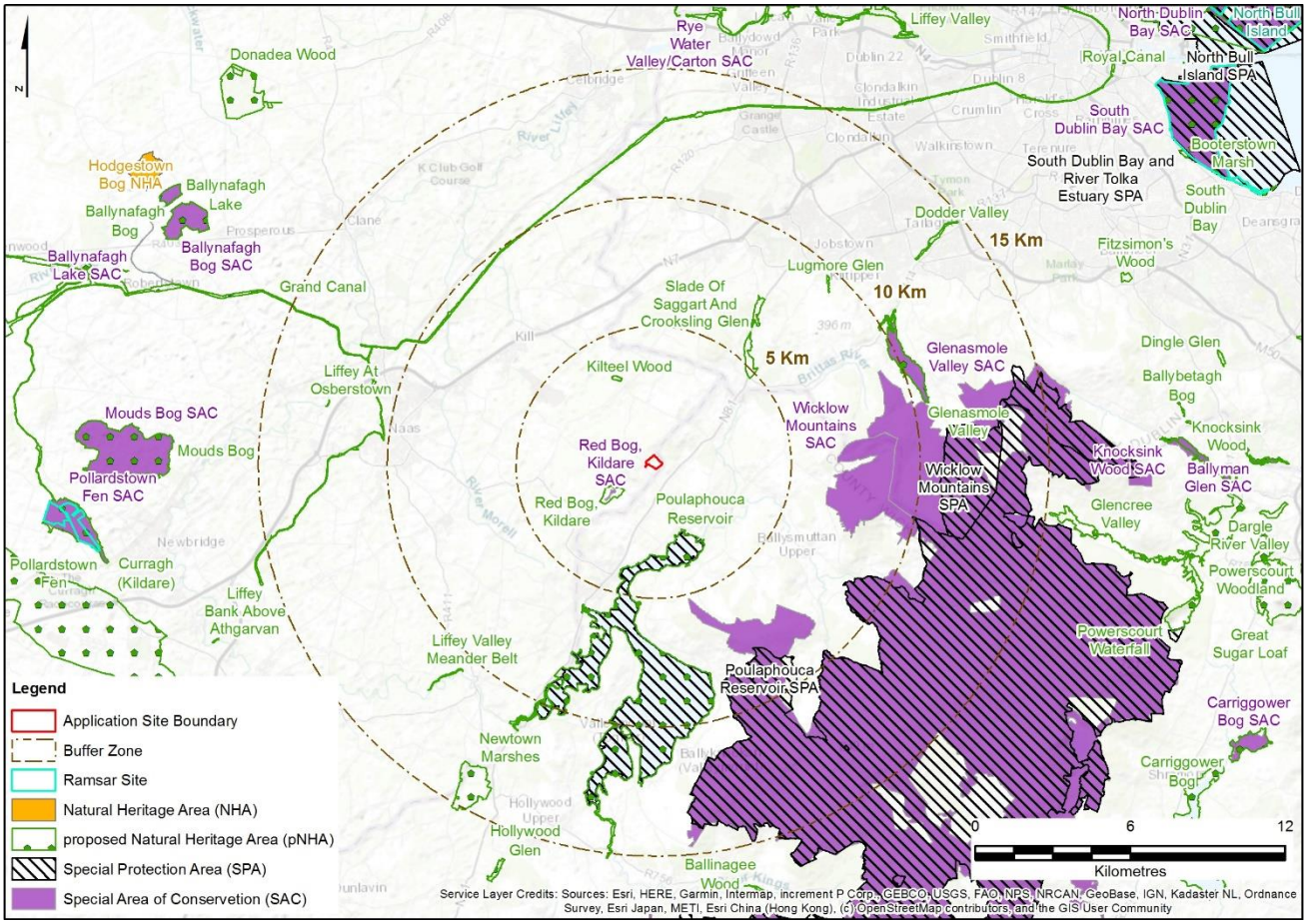

Figure 4-3: Designations surrounding the site, including 5, 10, and 15 km buffers.

International Designations (Natura 2000 sites)

There are five Natura 2000 sites located within 15 km of the proposed development, as listed below:

- Red Bog, Kildare SAC – also designated as a pNHA (c. 1.5 km south-west of the site);
- Poulaphouca Reservoir SPA – also designated as a pNHA (c.2.5 km south of the site);
- Wicklow Mountains SAC (c. 5.2 km south and 6.5 km east of the site);
- Wicklow Mountains SPA (c. 7.9 km south-east of the site); and
- Glensamole Valley SAC (c. 9.8 km north-east of the site).

For internationally designated sites with an acknowledged impact source and ecological pathway to the Site a Natura Impact Statement accompanies this planning application, and includes citations for such designations, and details on their exact proximity to the proposed development footprint.

National Designations (NHAs)

No NHAs were identified within 5 km of the site, with the closest being Hodgestown Bog NHA, located approximately 24.0 km north-west of the site.

Non-statutory Designations (pNHAs)

A total of three pNHAs were identified within 5 km of the proposed project footprint (Figure 4.3), as listed below:

- Red Bog, Kildare pNHA – also designated as an SAC (c. 1.5 km south-west of the site);
- Poulaphouca Reservoir pNHA – also designated as an SPA (c. 2.5 km south of the site);
- Kilteel Wood pNHA (c. 3.1 km north of the site); and
- Slade of Saggart And Crooksling Glen (c. 4.8 km north-east of the site).

Red Bog, Kildare pNHA and Poulaphouca Reservoir pNHA are the two nearest pNHAs to the Site. Given that these pNHAs are also assigned as Natura 2000 sites, which carry a higher level of protection, the assessment of these designations is covered separately within the NIS which accompanies this application. The next nearest pNHA to the Site is Kilteel Wood pNHA, and the verbatim description of this designation is provided below[1]:

"This site is located about 10 km north-east of Naas and immediately east of the village of Kilteel. The wood is situated on a hill which rises to 248 m.

The site is a small heathy wood mostly of oak (Quercus spp.) and Downy Birch (Betula pubescens). Other trees present include Beech (Fagus sylvatica), Sycamore (Acer pseudoplatanus), Ash (Fraxinus excelsior) and Scots Pine (Pinus sylvestris). In a clearing gorse (Ulex europaeus, U. gallii) and Heather (Calluna vulgaris) occur.

The ground vegetation is restricted, with the following species – Bilberry (Vaccinium myrtillus), Bluebell (Hyacinthoides non-scripta), Greater Stitchwort (Stellariaholostea), Wood Sage (Teucrium scorodonia), Heath Bedstraw (Galium saxatile),

Red Fescue (Festuca rubra), Wavy Hair-grass (Deschampsia flexuosa) and Creeping Soft-grass (Holcus mollis).

There were no signs of regeneration within the wood, probably due to grazing by sheep. There was evidence of timber removal, mostly individual branches but some entire trees. Some dumping of domestic refuse has also occurred.

This site is a fine example of a largely deciduous wood. Its elevated position gives it scenic value."

Evaluation

Kilteel Wood pNHA is situated in proximity to the site (3.1 km north) and is separated from the site by open agricultural land and the L2018, limiting any ecological connectivity. Accordingly, it is not anticipated that this pNHA will be subject to any direct effects as a result of development (e.g. from as a result of land take). Equally, given the distance and separation from the Site, it is considered unlikely that the development will result in any indirect effects on the pNHA, such as from an increase in noise levels or dust deposition. Furthermore, there does not appear to be any hydrological connectivity between the site and Kilteel Wood according to Environmental Protection Agency (EPA) mapping[2] . Figure 4.4 below illustrates that there are no surface water links between the Site and Kilteel Wood, which are in separate sub-catchments (refer Figure 4.4). Accordingly,

[1] https://www.npws.ie/sites/default/files/general/pNHA_Site_Synopsis_Portfolio.pdf [Accessed 02 December 2019]

[2] https://gis.epa.ie/EPAMaps/ [Accessed 10 December 2019]

it is considered highly unlikely that the proposed development will result in any negative effects on the qualifying features of this pNHA.

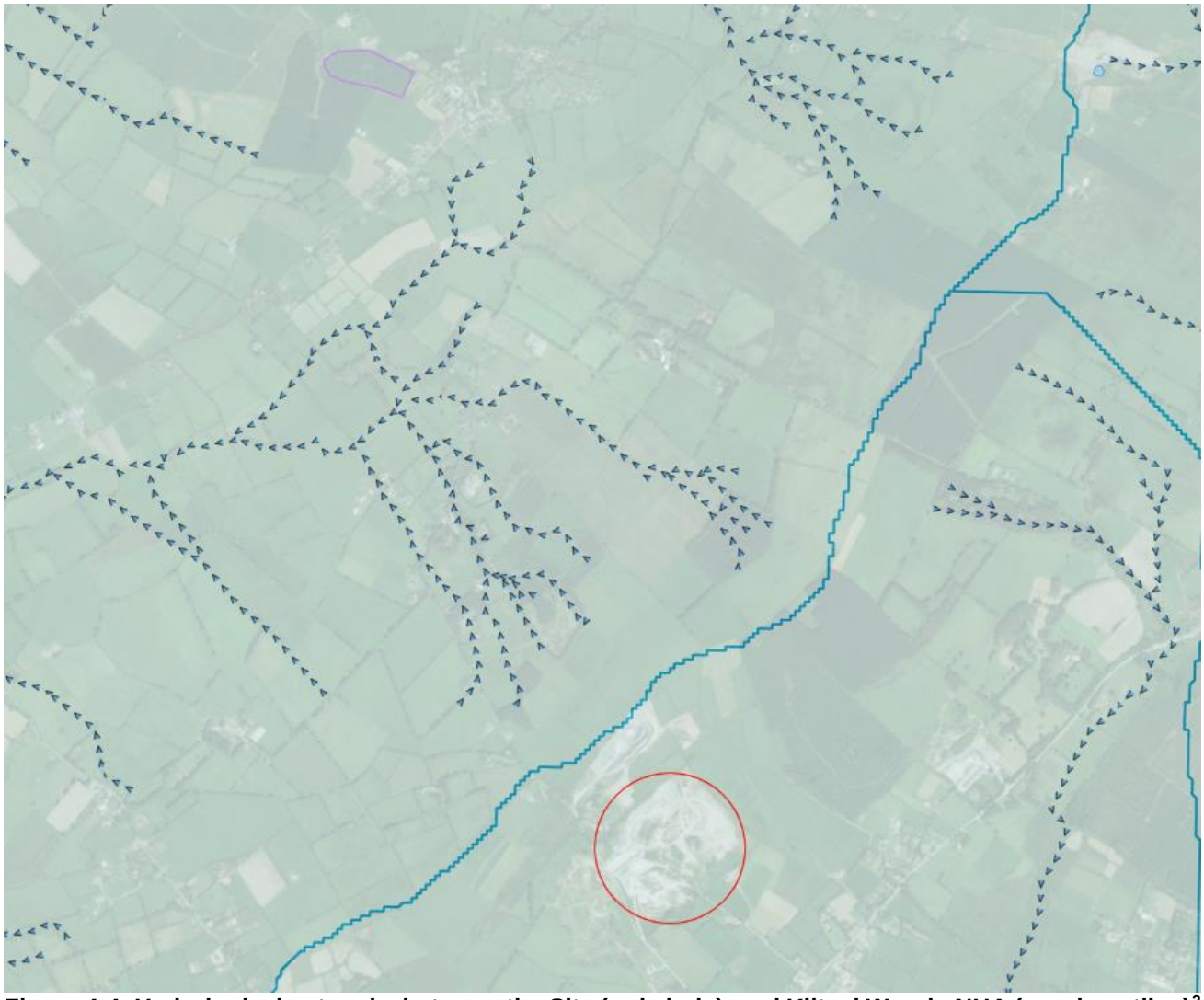

Figure 4-4: Hydrological networks between the Site (red circle), and Kilteel Wood pNHA (purple outline)[2]

Fauna

The National Parks and Wildlife Service (NPWS)[3] and the National Biodiversity Data Centre (NBDC) databases were searched for records of protected species within 5 km of the site from the last 20 years. No records were returned for protected species from within the site boundary. However, a number of records were returned from within the search area (including birds on the red or amber list[4]), as listed below.

Birds

- Common goldeneye (*Bucephala clangula*)
- Common greenshank (*Tringa nebularia*)
- Common redshank (*Tringa totanus*)
- Common snipe (*Gallinago gallinago*)
- Coot (F*ulica atra*)
- Cormorant (*Phalacrocorax carbo*)

[3] www.npws.ie mapviewer [accessed 30/10/2019]

[4] https://birdwatchireland.ie/ accessed 03/10/2019

- Curlew (*Numenius arquata*)
- Eurasian teal (*Anas crecca*)
- European golden plover (*Pluvialis apricaria*)
- Grasshopper warbler (*Locustella naevia*)
- Greylag goose (*Anser anser*)
- House martin (*Delichon urbicum*)
- House sparrow (*Passer domesticus*)
- Kingfisher (*Alcedo atthis*)
- Lapwing (*Vanellus vanellus*)
- Little egret (*Egretta garzetta*)
- Mute swan (*Cygnus olor*)
- Oystercatcher (*Haematopus ostralegus*)
- Red kite (*Milvus milvus*)
- Sand martin (*Riparia riparia*)
- Shoveler (*Anas clypeata*)
- Skylark (*Alauda arvensis*)
- Spotted flycatcher (*Muscicapa striata*)
- Starling (*Sturnus vulgaris*)
- Swallow (*Hirundo rustica*)
- Wheatear (*Oenanthe oenanthe*)
- Whooper swan (*Cygnus cygnus*)

Mammals

- Brown long-eared bat (*Plecotus auritus*)
- Eurasian pygmy shrew (*Sorex minutus*)
- Leisler's bat (*Nyctalus leisleri*)
- Otter (*Lutra lutra*)
- Pine Marten (*Martes martes*)
- Red squirrel (*Sciurus vulgaris*)
- West European hedgehog (*Erinaceus europaeus)*

It is noted that location information for a number of species is confidential and not provided on the database, including for golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), merlin (*Falco columbarius*), hen harrier (*Circus cyaneus*), marsh harrier (*Circus aeruginosus*), and white-tailed eagle (*Haliaeetus albicilla*).

The freely available desk study results should not be considered definitive data sets for the desk study area. An absence of desk study data does not necessarily dictate that a site is absent of notable flora or fauna.

Habitats

The NPWS database did not return any records for protected habitats or flora from within or adjacent to the site. Record of chickweed willowherb (*Epilobium alsinifolium*) was returned from the search area, a species protected under the Flora (Protection) Order 2015, however no evidence for the presence of this species within the site was recorded at the time of survey.

4.4.2 Habitat Assessment

The site is almost entirely comprised of active quarry, with surrounding habitats including improved grassland, trees, hedgerows, and colonising bare ground (Table 4.5). The habitat map of the site is presented in Figure 4.5. No protected habitats or flora species were recorded during the survey work. Where areas of the Site were inaccessible (as set out at section 4.3.4), the assessment of these areas has been based on a review of aerial imagery, a visual assessment on the ground (from accessible viewpoints), and a review of other habitats recorded within the Site.

Table 4-5: Habitats recorded on site (Fossitt, 2000)

Habitat	Habitat Code
Active quarry	ED4
Buildings and hardstanding	BL3
Grassland	GA1
Trees and Treelines	WD5 & WL2
Colonising ground	ED3
Scrub	WS1
Hedgerows	WL1
Drainage Ditch	FW4

Figure 4-5: Habitats map

Active Quarry ED4

The majority of the site is dominated by bare ground, associated with the footprint of the current quarrying activities. Whilst the vast majority of the active quarry footprint is sterile in terms of species presence and composition some peripheral development of flora was noted. The steep quarry faces preclude vehicular disturbance and pioneering species such as gorse (*Ulex europaeus*) and rosebay willowherb (*Chamerion angustifolium*), were recorded. Colonising ground recorded at the periphery of the quarry footprint is outlined in detail at the relevant section below.

The quarry activities have also led to the creation of a small number of artificial pools of water within the site. These pools were recorded at the base of deep excavations, with sheer, unvegetated rock faces surrounding the pools. The water itself was turbid in nature, with no aquatic or emergent vegetation. Due to health and safety restrictions, close inspections of these pools was not possible at the time of survey.

Figure 4-6: Active quarry

Buildings and Hardstanding BL3

Hardstanding is present within the south of the site, associated with a small bungalow. The bungalow and areas of hardstanding support negligible vegetation save for occasional colonising species consistent with the surrounding habitats. Species recorded to be colonising at the time of survey include colt's-foot (*Tussilago farfara*), fescue (*Festuca* sp.) ribwort plantain (*Plantago lanceolata*), rye-grass (*Lolium* sp.), weld (*Reseda luteola*), white clover (*Trifolium repens*), and yarrow (*Achillea millefolium*).

The value of the buildings within the site for fauna (namely nesting birds and bats) is discussed at the relevant section below.

Figure 4-7: The bungalow (subject to bat survey) and surrounding hardstanding

Grassland GA1

A single agricultural field is present within the south-east of the site[5]. The field appeared to be a grassland pasture subject to low-intensity grazing, with a single horse observed at the time of survey. The grass was tussocky, with a sward height of approximately 30-50 cm. The field is dominated by grasses, including fescue (*Festuca* sp.), false oat-grass (*Arrhenatherum elatius*), and Yorkshire-fog (*Holcus lanatus*). Few herbs are present, albeit common bird's-foot-trefoil (*Lotus corniculatus*) is visible in some areas. In addition, localised patches of tall ruderal vegetation are present, predominantly comprising thistles, and in association with some scrub.

In other areas of the site, small pockets of grassland are present in areas of previously disturbed ground. The grassland is characteristic of the historic land use and agricultural setting, with the species composition being reminiscent of improved grassland, granted that these areas are not subject to an active management regime, with a sward height of up to 0.6 m. These other pockets of grassland include an area dominated almost exclusively by rye-grass (*Lolium* sp.), with occasional Timothy (*Phleum pratense*), and other areas more synonymous with the agricultural field, albeit with a somewhat higher diversity of species, including localised increases in ruderal content, with additional species recorded including sweet vernal-grass (*Anthoxanthum odoratum*), cock's-foot (*Dactylis glomerata*), cleavers (*Galium aparine*), clover (*Trifolium* sp.), colt's-foot, common nettle (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), dock (*Rumex* sp.), hogweed (*Heracleum sphondylium*), horsetail (*Equisetum* sp.), knapweed (*Centaurea nigra*), common ragwort (*Senecio jacobaea*), ribwort plantain (*Plantago lanceolata*), rosebay willowherb, and vetch (*Vicia* sp.). Occasional bramble (*Rubus fruticosus*) scrub was also observed in the grassland habitat. Where scrub was recorded in high frequency, this is depicted as 'matrix off grassland and scrub' on Figure 4.5.

Trees WD5 & WL2

A small number of standard trees are present within the site, associated with the site boundaries or with areas of scrub. The trees within site range from young to early mature, the majority being semi-mature. Tree species recorded within the site include ash (*Fraxinus excelsior*), and willow (*Salix* sp.).

Figure 4-8: Trees within the site with surrounding scrub

[5] Due to access restrictions, the field and its boundary features were surveyed from a distance, as discussed at section 1.4.

A single coniferous treeline is present within the site, adjacent to the bungalow. The treeline comprises a well-established line of conifers, forming a tall, dense landscape feature. Negligible understorey or ground flora was recorded associated with the treeline.

Colonising ground ED3

Much of the Site, outwith the active quarry footprint, but within the footprint of disturbed ground, is becoming colonised by herbaceous plants. These areas include scrapes of earth that appear to be subject to infrequent vehicular disturbance around the periphery of the quarry, together with the sloping sides of earth banks. The substrate in these areas is a combination of soil and small to large shingles. Generally vegetation cover exceeds 50% of the bare ground, and species recorded in these areas include crested dog's-tail (*Cynosurus cristatus*), yorkshire-fog, colt's-foot, common bird's-foot trefoil, common eyebright (*Euphrasia nemorosa*), common ragwort, red clover (*Trifolium pratense*), scentless mayweed (*Tripleurospermum inodorum*), yarrow (*Achillea millefolium*). Young scrub was also a frequent attribute in the colonising ground, dominated by butterfly-bush (*Buddleja davidii*). Where scrub was recorded in high frequency, this is depicted as 'matrix off colonising ground and scrub' on Figure 4.5.

Some areas of colonising ground resemble the early stages of development of open mosaic habitat, especially where it is found abutting the edges of scrub habitat and grassy banks. However, this habitat of relatively poor value, frequently supporting large swathes of species-poor early colonising vegetation, rather than a matrix of high value habitats.

Figure 4-9: Colonising ground

Scrub WS1

Areas of continuous scrub are present within the site, largely associated undisturbed mounds of earth around the periphery of the quarry. Scrub species recorded within site include ash, bramble (*Rubus fruticosus*), butterfly-bush, crack-willow (*Salix fragilis*), field maple (*Acer campestre*), goat willow (*Salix caprea*), gorse (*Ulex europaeus*), holly (*Ilex aquifolium*), rose (*Rosa* sp.), and silver birch (*Betula pendula*).

Where dense swathes of scrub have been left unmanaged, these are impenetrable in nature, and often comprise areas of more developed, mature scrub, with some young trees developing. In other areas, some scattered scrub has developed in association with other habitats (namely grassland and colonising ground), creating a habitat matrix (see Figure 4.5).

Figure 4-10: Scrub on the Site Periphery

Hedgerows WL1

Hedgerows line the boundary of the site along the north-western, north-eastern, and south-eastern flanks. Where accessed (in the north of the site), these hedgerows were recorded to be outgrown and leggy in nature, dominated by hawthorn (*Crataegus monogyna*) and gorse measuring approximately 4-5m in height. The hedgerows are associated with a dry ditch, which was recorded to support species consistent with adjacent habitats, together with some encroaching butterfly-bush scrub.

Figure 4-11: Hedgerow along the northern boundary of the site

Drainage Ditch FW4

A small number of drainage ditches were recorded around the site. These were associated with the boundary hedgerows, and with scrub in the south-west of the site. The ditches generally comprised shallow ditches which did not hold any water, whilst the vegetation they supported was consistent with the adjacent habitats, often with a higher ruderal content, together with brash and leaf litter.

4.4.3 Fauna assessment

The presence, or potential presence, of species on the site was identified from the desk study and Phase 1 Habitat survey. In addition, specific survey work was carried out in respect of roosting bats, as outlined below.

Bats

Buildings

Visual inspections

A single bungalow is present within the south of the site, and was subject to a detailed visual assessment in order to assess its potential to support roosting bats.

The bungalow comprises a ground floor, and a smaller upper storey set within the roof with dormer windows (see Figure 4.12). The building is of brick construction with render and appeared to be in a relatively good state of repair at the time of survey and in use as lodgings for site workers. A small single storey flat-roofed extension is present on the southern elevation of the building.

Figure 4-12: The bungalow within Site

The building supports a pitched roof with clay tiles, including clay ridge tiles. The tiles were generally well fitted, however occasionally gaps beneath tiles were observed. In addition, some missing mortar beneath tiles on the southern gable end was recorded (see Figure 4.13). No loft void is present given that the roof has been built into, however there is potential for a small cavity to be present between the ceilings of the upper storey and the tiles.

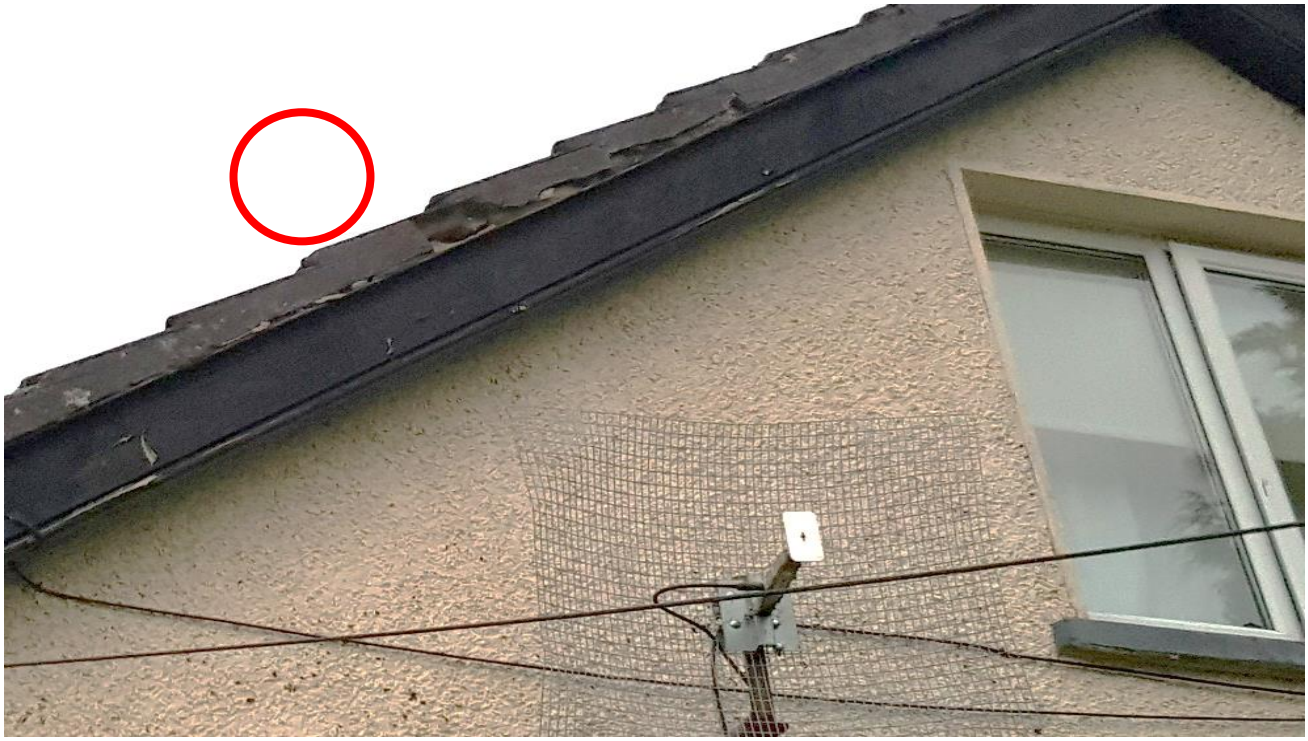

Figure 4-13: Gaps in mortar

A chimney stack is present on the western elevation, with some lead flashing at the join between the chimney and the roof, and lead flashing also present around the dormer windows. The lead flashing appeared to generally be well fitted, albeit it was noted to be lifted in a couple of locations. The building supports wooden soffit boxes typically in a good state of repair, however the wood is relatively old and small gaps are present around the soffits where the wood has warped from weathering.

As described above, the bungalow offers a number of opportunities for access and egress of bats, including some lifted tiles, gaps in soffit boxes, lifted lead flashing, and gaps in mortar. Accordingly, it is considered that the building supports **moderate** potential to support roosting bats.

Emergence survey work

Given that the bungalow has been assessed as having potential for roosting bats, the building was subject to a dusk emergence survey in August 2019. No bat emergences were recorded during this survey work. Other activity was recorded in the vicinity of the building, with such activity including a small number of passes by soprano pipistrelle (*Pipistrellus pygmaeus*) and common pipistrelle (*Pipistrellus pipistrellus*) bats, however Leisler's bat (*Nyctlaus leisleri*) was the dominant species recorded, accounting for the majority of bat activity recorded – a typical example of a call displaying the characteristics of a Leisler's bat during the survey work is provided below in Figure 4.14.

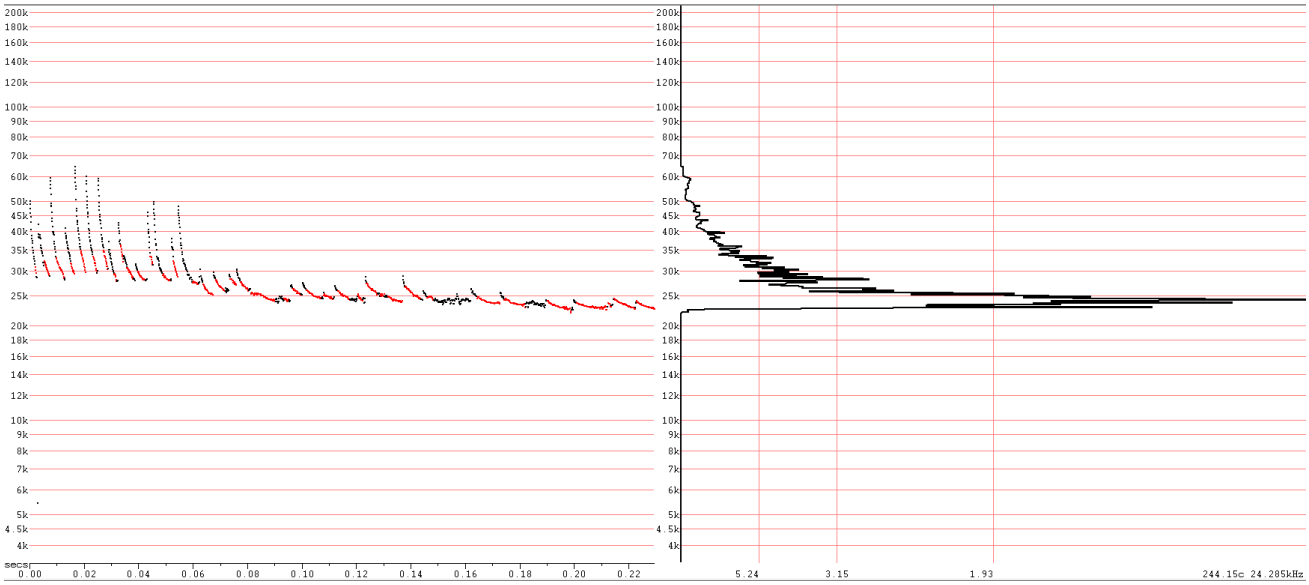

Figure 4-14: Typical Leisler's bat call (sonogram) recorded within the site during the survey work.

Trees

A small number of trees were observed in the south of the site and along the south-western site boundary, such as semi-mature to mature ash and willow trees, which exhibited some potential to support roosting bats. The trees generally appeared to support low bat potential due to supporting a dense covering of ivy.

Birds

Whilst specific survey work for birds was deemed necessary (based upon the habitats present and the nature of the site), the opportunity was taken during the survey work carried out at the site to record any incidental observations of birds and / or nesting behaviour. A single magpie (*Pica pica*) was recorded perched on boundary vegetation during the habitat survey work. In addition, a number of swallows were recorded to be nesting on offsite buildings, directly adjacent to the south-western site boundary. Finally, evidence for the use of the site by sand martins was recorded adjacent to the footprint of the quarry activities, in the form of a number of nest holes visible in a sheer sandy bank (see Figure 4.15).

Figure 4-15: Sand martin nest holes

Summary

The presence, or potential presence, of species on the Site was identified from the desk study and Phase 1 Habitat survey. Summary Table 4.6 lists the species which were considered likely to occur within the site, on the basis of the presence of suitable habitat and/or the occurrence of recent records in the vicinity. The species, together with its legislative designation is listed.

The source(s) of information relating to each species could include:

- Existing records from desk study;
- Presence of suitable habitat identified during the Phase 1 survey;
- Results of specific survey work (i.e. relating to badger and bats); and / or
- Direct observation.

For each species with the potential to occur on site, the final column of Table 4.6 presents a brief summary of the status of the species in relation to the site itself. If the survey fails to record the species and the habitats are unsuitable, then it is concluded that the species is unlikely to occur, and it is not considered further within the assessment. If a species is confirmed as present, an indication of the likely population size/status within the site is provided. This information is used in the evaluation presented in Table 4.7.

Table 4-6: Assessment of the potential for faunal species to occur within the site.

Species/Group	Status	Summary of status on site
Badger	Wildlife Acts (1976 – 2010)	No evidence for the presence of badger was recorded during the survey work. However, the site periphery supports habitats suitable for foraging and hedgerows may be suitable for sett building.
Common mammals (such as fox and rabbit)	-	Potential to occur within the site.
Irish Hare	Wildlife Acts (1976 – 2010)	Potential to occur within the site.
Otter	Wildlife Acts (1976 – 2010) – EU Habitat Directive.	Unlikely to occur within the site owing to a lack of aquatic resource for this species.
Stoat	Wildlife Acts (1976 – 2010)	Potential to occur within the site.
Hedgehog	Wildlife Acts (1976 – 2010)	Potential to occur within the site.
Red Squirrel	Wildlife Acts (1976 – 2010)	No available resource within the site (mixed woodland).
Pygmy Shrew	Wildlife Acts (1976 – 2010)	Potential to occur within the site.
Bats	Wildlife Acts (1976 – 2010) – EU Habitat Directive.	The site supports some suitable foraging habitat. Potential for roosting bats identified within the onsite bungalow, whilst some potential[6] roosting habitat may be available from semi-mature to mature trees.

[6] A tree or trees of sufficient size to exhibit potential roosting features but none seen from the ground or with limited roosting potential, Collins 2016.

Species/Group	Status	Summary of status on site
Birds	Wildlife Acts (1976 – 2010), EU Birds Directive, Birds of Conservation Concern (BoCC[7], Ireland).	The site, in particular the hedgerows, trees, and mature scrub, offer a plethora of nesting, foraging and commuting habitat for bird species. Common and widespread species such as magpie were recorded on site. In addition, swallows and evidence of sand martins (Amber list species[8]) were recorded. No Annex 1 (EU Birds Directive) species were recorded.
Aquatic Fauna	Salmonids, Wildlife Acts (1976 – 2010) – EU Habitat Directive.	No available resource within site.
Other Taxa (e.g. Lepidoptera / Odonata)	-	Some potential to occur within the site, particularly in relation to sandy banks associated with the quarry, and decaying wood associated with the scrub habitat.

4.4.4 Invasive species

No invasive or alien species were noted during the site surveys (though a systematic search was not undertaken).

4.5 Evaluation

The evaluation of ecological features (sites, habitats and species) which could be affected by the project proposals is presented in Table 4.7. The table includes:

- Any statutory designated areas, with the exception of Natura 2000 sites, which are situated within 5 km of the project site that have potential ecological connection(s) with the site;
- Any surface or groundwater bodies that have hydrological connectivity with the site;
- Any habitat type recorded within the site; and
- Any species of conservation importance which has been confirmed as occurring / has potential to occur within the site.

The value of the feature is based upon how important the feature is in relation to its geographical context. In other words, at what level of geographical resolution would the feature contained within the site (habitat or species) be recognised as contribution to biodiversity to a significant degree. The evaluation takes into account extent (or population size) within the site compared to the resource elsewhere and whether it has characteristics which either elevate or depress its importance in comparison with a 'typical' example (for example, whether a habitat is particularly species rich, or depleted in species).

Common and widespread species or habitat, therefore, only have a level of importance in respect of the biodiversity of their immediate area (taken in this case to be represented by the boundary of the site). Such features are not considered further within the Impact Assessment. Some protected species may, under certain circumstances (such as a single example occurring within the site, as part of a much larger local population) be considered to only be of importance within the site itself. Such species, on the basis of legal and planning regulation compliance, are included within the Impact Assessment and, (if necessary) dedicated impact mitigation measures are provided. Table 4.7 presents each feature occurring, together with the rationale for its evaluation.

[7] Colhoun, K. & Cummins, S. (2013) Birds of Conservation Concern in Ireland 2014–2019. Irish Birds 9: 523–544.

[8] https://birdwatchireland.ie/ accessed 11/11/2019

Table 4-7: Classifying the geographical Importance of Key Ecological Features

Key Ecological Features	Importance	Rationale
Designated Sites		
Red Bog, Kildare pNHA	Regional	This feature is situated in proximity to the site, and there is potentially ecological connectivity between the site and the feature. Given that Red Bog, Kildare is also designated as a SAC, potential impacts on this feature are considered in full in the accompanying NIS.
Poulaphouca Reservoir pNHA	Regional	This feature is situated in proximity to the site, and there is potentially hydrological connectivity between the site and the feature. Given that Poulaphouca Reservoir is also designated as a SPA, potential impacts on this feature are considered in full in the accompanying NIS.
Kilteel Wood pNHA	Regional	This feature is situated in proximity to the site (3.1 km north) and is separated from the site by open agricultural land, limiting any ecological connectivity. Equally, there does not appear to be any hydrological connectivity between the site and Kilteel Wood, being located in separate sub-catchments. As such, the Kilteel Wood pNHA is not considered further within this report.
Habitats		
Active Quarry and Buildings and Hardstanding	Negligible	This habitat offers negligible biodiversity value. Not considered further in this assessment.
Grassland	Site	This habitat represents a valuable resource in terms of farmland, but not in terms of biodiversity given the site is in an area with abundant farmland, and this type of habitat is considered to be ubiquitous and not inherently biodiverse or rare in accordance with ecological value based upon the criteria defined by Ratcliffe (1977), namely: naturalness, size, rarity and diversity. This resource offers negligible biodiversity value and is not considered further in this assessment.
Trees and Treelines	Local	The treeline within site comprises of coniferous species, with negligible understorey or ground flora. The non-native treeline is of limited botanical value, and accordingly is not considered further within this assessment. Broadleaf trees represent a valuable resource for fauna such as roosting bats and birds, and breeding birds in particular. This feature is carried forward into the design mitigation and impact assessment sections.
Colonising Ground	Site	This type of habitat is considered to be ubiquitous and not inherently biodiverse or rare in accordance with ecological value based upon the criteria defined by Ratcliffe (1977), namely: naturalness, size, rarity and diversity. Not considered further in this assessment.

Key Ecological Features	Importance	Rationale
Scrub	Site	This habitat is not extensive within the site, and is considered to be ubiquitous and not inherently biodiverse or rare in accordance with ecological value based upon the criteria defined by Ratcliffe (1977), namely: naturalness, size, rarity and diversity. Not considered further in this assessment.
Hedgerows	Local	The hedgerows at the site boundaries were recorded to be relatively species-poor, whilst this habitat is also common and widespread in the wider surrounds of the site. Nevertheless, the hedgerow habitat provides connectivity across the site and with the wider landscape, and represents a valuable resource for fauna such as birds, and breeding birds in particular. This feature is carried forward into the design mitigation and impact assessment sections.
Drainage Ditch	Site	The drainage ditches within site were largely dry, and did not typically support any aquatic or emergent species. Not considered further in this assessment.
Species		
Bats	Local	The site supports some suitable foraging and commuting habitat, albeit limited. Roosting bat potential has been recorded within a single building on site, whilst some potential[9] roosting habitat may be available from mature trees. This feature (species group) is carried forward into the design mitigation and impact assessment sections.
Badger	Site	The Site supports suitable foraging habitat, although no setts were observed. It is considered highly unlikely that this species will be residually affected by Project proposals. Nevertheless, badgers are mobile animals, and as such badger activity can change rapidly at a site. Accordingly, mitigation measures are set out at section 5.8 in order to safeguard badgers, in the event of future colonisation.
Irish Hare	Site	The site exhibits some sub-optimal foraging and commuting habitat. However, it is considered unlikely that this species will be residually affected by Project proposals. Not considered further within this report.
Small Mammals	Local	The peripheral site supports suitable foraging and commuting habitat. This feature (species group) is carried forward into the design mitigation and impact assessment sections.
Breeding Birds	Local	The site scrub, hedgerows, and trees are likely to support a number of common and widespread bird species. This species group (breeding birds) is carried forward into the design mitigation and impact assessment sections.

4.6 Inherent Design Mitigation

This section describes the mitigation measures that are incorporated at the design stage. Additional mitigation measures not incorporated at the design stage are considered under Section 5.8. A number of measures which

[9] A tree or trees of sufficient size to exhibit potential roosting features but none seen from the ground or with limited roosting potential, Collins 2016.

follow generic best practice are proposed to mitigate the impacts of the proposed development on the ecological environment at the site which include:

- All Site construction will be undertaken in accordance with the CIRIA (2016) Environmental Good Practice on Site Guide (fourth edition); and
- Lighting will be minimised during hours of darkness and will not illuminate peripheral mature trees and vegetation to ensure no adverse effects on bats and other nocturnal species.

A restoration plan will replace lost habitats which had been of importance to birds and small mammals within the site. The restoration plan is intended to fit within the planned phasing of works and the creation of habitat shall be an ongoing process during active working periods.

4.7 Impact Assessment

Given the nature of the works (being to extend the life and area of an active quarry), any potential impacts will be realised in two phases; the combined construction / operational phase, and the decommissioning/restoration phase, and this is reflected in the assessment of potential impacts below.

The key construction / operational and decommissioning/restoration impacts assessed are:

- Disturbance to habitats and species through noise, traffic, and blasting;
- Impacts on water quality and quantity;
- Permanent habitat loss;
- Modification and change in habitat composition over project life and eventual closure;
- Individual species mortality; and
- Impacts of dust as a result of extraction and restoration activities.

Potential direct and indirect impacts from water quality and quantity are as follows:

- Impacts of dust and site runoff (sediments, fuel, etc.) as a result of quarrying activities;
- Impacts on groundwater and surface water from site de-watering (drawdown) and usage; and
- Impacts on groundwater and surface water from site closure.

4.7.1 Hedgerows

Characterisation of Unmitigated Impacts

Boundary hedgerows are retained under the proposed development. Accordingly, the potential for ecological impact to hedgerows, in the absence of mitigation focuses on the following factors:

- Potential un-planned encroachment of machinery and quarry footprint; and
- Dust deposition and subsequent changes in habitat composition.

Damage to hedgerows or modification would afford a negative impact. In the absence of mitigation, this may restrict this resource to fauna during the operational life of the quarry.

Rationale for Prediction of Effect

Degradation of foraging habitat and potential habitat severance is less likely to cause stress to species associated with hedgerow habitat given the abundance of optimal habitat within the local setting. On a precautionary basis, it is considered certain that this impact will negatively affect the conservation status of these linear landscape features.

Effect without Mitigation

The unmitigated effect of this development would result in a **minor** negative impact on habitat of **local** sensitivity and importance.

4.7.2 Trees

The potential for ecological impact to trees in the absence of mitigation focuses on the following factors:

- The removal of this trees within the new development footprint;
- Potential un-planned encroachment of machinery and quarry footprint; and
- Dust deposition and subsequent changes in habitat composition.

Characterisation of Unmitigated Impact

A small number of trees will be permanently lost under the proposed development. In addition, there is potential for habitat degradation of any retained trees within site due to quarry activities, such as increased dust deposition.

Habitat removal or modification would afford a negative impact. In the absence of mitigation, mammal and bird nesting, foraging and commuting habitat may be restricted during the life of the quarrying activities.

Rationale for Prediction of Effect

Losses of foraging / nesting habitat is less likely to cause stress to species associated with trees given the abundance of optimal habitat within the local setting. Nevertheless, on a precautionary basis, it is considered certain that this impact will negatively affect the conservation status of these landscape features.

Effect without Mitigation

The unmitigated effect of this development would result in a **minor** negative impact on habitat of **local** sensitivity and importance.

4.7.3 Bats

Characterisation of Unmitigated Impacts

The potential for ecological impacts to bats as a result of the development has been evaluated during the initial assessment of potential roosting features and habitat quality. The removal of woody vegetation such as trees and scrub would temporarily remove foraging and commuting habitat for bats. Potential effects to bat species include a negative biophysical effect to scrub and peripheral habitat which may inhibit bat commuting value. Linear landscape features, such as hedgerows, are important habitats for bats, providing flight paths between roosts and foraging sites and as foraging habitats (e.g. Verboom & Huitema 1997, Oakeley & Jones 1998, Russ & Montgomery 2002). It is understood that the hedgerows at the site periphery will be retained under the proposed development, thus maintaining the value of this feature to foraging / commuting bats.

Trees within the Site generally exhibited low bat roosting potential.

Predicted impacts therefore constitute the following:

- Loss of the bat foraging habitats that may be removed through the development of the proposed quarry development; and
- Increased noise and human activity along commuting routes and within foraging habitats.

It is considered possible that habitat removal or modification would afford a negative impact on local bat populations. Lighting during the hours of darkness would further reduce the quality of foraging and roosting habitat for bats. Noise effects associated with the operation of the quarry would be temporary during diurnal parts of the day and no nocturnal noise effects are anticipated. In the absence of mitigation, the loss of roosting, foraging and commuting habitat would be experienced during the operational life of the quarry.

Rational for Prediction of Effect

Trees within site were assessed for their potential to support roosting bats, however (as previously discussed) not all areas of the Site were accessible for survey. Of the trees subject to assessment, these were recorded to exhibit negligible or low bat roosting potential.

The bungalow within site was recorded to support moderate potential for roosting bats. A single dusk emergence survey was undertaken in order to identify any bat roosting activity associated with the building. Whilst some incidental bat activity was recorded in the vicinity of the building, no evidence of roosting bats utilising the bungalow was recorded throughout the survey work.

In order to form a more robust assessment of the potential use of the site by bats, and in line with best practice, it is considered that additional survey work on this building and trees will likely be required in advance of site clearance works, as detailed further in Section 5.8. Nevertheless, on the basis of the information gathered to date (the potential roosting features, and the bat species recorded throughout surveys undertaken), it is considered unlikely that the site supports a bat roost of high conservation significance (such as a maternity roost or roost of a rare species in Ireland).

On a precautionary basis, the rationale for effect on bat species considers that a small number of low-status roosts may be affected by the proposed development (potentially present in the building or trees). The footprint of the proposed development is considered to be poor and relatively ubiquitous in terms of foraging value. Nevertheless, on a precautionary basis, it is considered likely that these impacts could negatively affect the conservation status of the bat population.

Effect without Mitigation

The unmitigated impact of this development would result in **moderate** short-term and long-term effects to species of site and **local (low)** importance.

4.7.4 Small Mammals

Characterisation of Unmitigated Impact

The potential for ecological impact to the small mammal group, in the absence of mitigation focuses on the following factors:

- Operational noise disturbance;
- Vegetation and habitat removal (Scrub, bare ground and grassland); and
- Dust deposition and subsequent changes in habitat composition (changes to structural, foraging and commuting habitat).

The small and medium mammal group includes rabbit (*Oryctolagus cuniculus*), stoat (*Mustela erminea*), pygmy shrew, and hedgehog. Although this group of species are generally mobile, operational impacts attributed to noise, vegetation removal and dust deposition must be considered. Dust that settles on plants, can affect the plants' transpiration, respiration and other metabolic activity, by clogging pores and damaging waxy cuticles on the leaves, and by reducing available light. Dust can alter soil and water chemistry, structure and trophic status which may have impacts on the composition of plant and invertebrate communities. Dust can have direct impacts on insect and other invertebrate populations. Impacts on plant and invertebrate communities may result in effects further up the food chain (small mammals).

Rationale for Prediction of Effect

The variable effects associated with operational noise and potential habitat severance and loss at different distances from the source of disturbance, are very little understood for small to medium mammals. Habitat loss would be likely to afford a level of perceived stress and possible mortality, dependent on species mobility, though this is not certain. Minor losses of foraging habitat and potential habitat severance is less likely to cause stress to this species group given the availability of other suitable habitat (scrub, grassland) within the local (low)

setting. On a precautionary basis, it is considered likely that this temporary impact could negatively affect the conservation status of the local small mammal population.

Effect without Mitigation

The unmitigated effect to this group would result in **minor** short-term and long-term impacts to species of site and **local (low)** importance. Small mammals such as stoat and hare are protected under the Wildlife Acts (1976-2010).

4.7.5 Breeding Birds

Characterisation of Unmitigated Impacts

The potential for ecological impact to the breeding bird group, in the absence of mitigation focuses on the following factors:

- Operational noise;
- Vegetation and habitat removal (trees, scrub);
- Dust deposition and subsequent changes in habitat composition (changes to structural, foraging, breeding and commuting habitat); and
- Potential effects to bird species include a negative biophysical effect to vegetation availability which may disturb breeding birds and reduce available forage.

Potential losses of available nesting habitat as a result of the quarry development would be discrete and dependant on habitat type. In the context of the available nesting habitat within the trees and scrub vegetation at the Site and Local level, the impact may be considered minor. Noise effects associated with the operation of the quarry would be temporary and reversible. The loss of habitat would be subject to restoration proposals.

Rational for Prediction of Effect

The rationale for effect to bird species considers that discrete losses of available nesting habitat may occur. The site footprint is considered to exhibit some suitable breeding bird habitat for passerines. It is considered that effects to treeline and hedgerow habitat are discrete and wholly reversible. Minor losses of scrub and trees, used for foraging and breeding, are unlikely to cause stress to this group given the abundance of habitat (mature trees, hedgerow and pasture) within the local setting. On a precautionary basis, it is considered likely that this temporary impact could negatively affect the conservation status of the bird population

Effect without Mitigation

The unmitigated impact on this feature would result in a **minor** short to medium-term effects to species of **site** importance. The majority of bird species are protected under the Wildlife Acts (1976-2012) where it is an offence to hunt, interfere with or destroy their breeding or resting places unless authority is obtained via statutory licence provision.

4.8 Mitigation, Compensation and Enhancement Measures

The principal objective of the ecological mitigation is to take measures to reduce negative effects of the proposals upon the existing ecological value of the site. Where negative effects cannot be entirely avoided it is often necessary to enhance the ecological value of the locality through the creation of appropriate compensatory habitats. Avoidance of negative effects through design is included earlier in the Design Mitigation section of this Chapter. Details of committed mitigation, compensation and enhancement measures are outlined in this section.

4.8.1 Environmental Management Plan

All details of mitigation will be integrated into an *Environmental Management Plan* (EMP). This will include, for example, Construction Method Statements, Pre-construction Works and use of Ecological Clerk of Works to oversee implementation of ecological requirements.

The EMP will require the production of a *Habitat Management Plan* (HMP), detailing relevant and necessary prescriptions for management of features, for which broad objectives are described in the following sections.

The EMP will also require the production of a *Restoration Plan,* detailing appropriate habitat creation and restoration measures to be implemented upon the decommissioning phase of the quarry.

4.8.2 Hydrocarbons/Chemical safeguards & Protection of site water

Proposed mitigation measures are outlined as follows (much of these are already implemented at the existing quarry site):

- All soil / overburden stockpiles shall be covered (i.e. vegetated) to minimise the risk of rain / wind erosion;
- Restoration of topsoil and overburden will be carried out on a phased basis to reduce the vulnerability of the underlying aquifer to possible contamination;
- Continued operation and maintenance of the existing bunds and proposed hydrocarbon interceptor will occur;
- Regular maintenance and emptying of the proposed hydrocarbon interceptor as per manufacturer's recommendations will be implemented;
- All plant and machinery will continue to be regularly serviced before being used on site;
- Mobile plant fuelling should take place in a designated area of site with appropriate drip trays/nappies in place. Static plant or tracked excavators will refuel over a drip tray with an absorbent mat. In addition, spill kits will be maintained on site to deal with all spills and leaks, and spill training will be provided to relevant staff members;
- Internal trafficked areas of the Site will be surfaced (where applicable) with black-top to minimize dust suppression and soiling of the public road;
- Mobile bowsers, tanks and drums will be stored in secure, impermeable storage areas away from open water;
- Fuel and oil containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile stores;
- Containers and bunding for storage of hydrocarbons and chemicals will have a holding capacity of 110% of the volume to be stored;
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- Drip-trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel mobile plant on site;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills; and,
- An emergency spill kit (including absorbers) will be available for use in the event of an accidental spill on the quarry floor and key personnel trained in their use.

4.8.3 Protection of Retained Habitat

In order to protect retained hedgerows and trees, such vegetation will be protected with secure fencing prior to the commencement of construction works on site. This protection will be designed following NRA guidance (NRA, 2005), in particular with regard to root protection areas and fencing specifications (unless otherwise advised by a suitably qualified arboriculturalist).

Dust suppression will be implemented in accordance with best practice guidance (CIRIA, 2016).

4.8.4 Habitat Compensation

Removal of boundary hedgerows and trees outside the development footprint will be avoided where possible.

Planting will be required to mitigate for tree removal and future restoration plans will be required to be replace any trees and shrub species removed on a “like for like” basis (as a minimum). Consideration should be given towards hawthorn, blackthorn mix with individual alder and birch (to form native tree hedges) and deciduous trees (native tree species include oak, alder, birch).

In the short-term, it is recommended that hedgerows are planted as part of buffer zones to maintain ecological connectivity.

4.8.5 General Faunal Safeguards

In order to safeguard any fauna (such as badgers or small mammals) should they enter the site during works, a number of safeguarding measures should be implemented. These measures and specific roles and responsibilities of these tasks would be described within the HMP such as:

- Any excavations that will remain overnight should include measures to ensure any mammals that may enter the excavation have a way to get out, such as graded banks, or a rough plank of wood to act as a ‘crawl board’;
- Should the works expose any pipework, for any larger pipes (supporting a diameter of approximately 15cm or larger), any exposed ends of piping should be covered, to prevent any mammals (such as badger) making opportunistic use of the piping;
- Any fuel or chemical storage within the site should take into consideration the risk of access and / or damage by mammals (such as foxes *Vulpes* or badger); and
- Good working practices should be observed across the site, such as avoiding littering and maintaining a tidy construction area with materials stored on pallets.
- Dust suppression will be implemented in accordance with best practice guidance (CIRIA, 2016).

4.8.6 Roosting Bats

Trees

When a tree removals plan has been established, this will inform further inspections of trees for bat roosting potential (if required)[10]. In the event that further survey identifies trees with moderate or high bat roosting potential that will require felling, further survey work will likely be required in order to establish the presence or absence of roosting bats (i.e. aerial inspection or dusk/dawn survey work). Should a bat roost be identified within any trees subject to survey, a derogation licence will need to be sought in order to facilitate the felling of such trees.

Any trees recorded to have low bat roosting potential should be felled in a manner that reduces the risks of harming fauna in the process (soft felling, refer below). Soft-felling involves the whole of the tree and any large branches being cut down in sections, with each section being carefully lowered to the ground. Once felled, timber will be left in situ on the ground for a minimum of 24 hours before being chipped or removed in order for any resident fauna to disperse without harm.

Buildings (the onsite bungalow)

It is considered that additional survey work is required on the onsite bungalow in order to fully inform the potential for roosting bats to be utilising the building. It is recommended that this takes the form of at least one further survey, comprising a dawn re-entry survey.

[10] Assumes that trees will be accessible to survey, subject to health and safety restrictions.

Should any roosting bats be identified to be utilising the on site building, a derogation licence will need to be sought in order to facilitate the demolition of the bungalow. Such a licence would include a full mitigation strategy to minimise residual effects and ensure that the favourable conservation status of bats is maintained at the site.

4.8.7 Sensitive Lighting

For any external lighting prescribed under the proposed Project, it is recommended that a suitable lighting strategy is developed, under advice from a suitably qualified ecologist. The lighting strategy will aim to maintain any opportunities around the Site for nocturnal and crepuscular species by using timers, cowls and hoods to maintain dark skies and avoid illuminating features such as the woodland and hedgerow habitat.

4.8.8 Badger

Badgers are mobile animals, and as such badger activity can change rapidly at a site. Accordingly, it is recommended that pre-construction badger surveys are undertaken prior to site clearance works, in order to identify the extent of use by badgers at the time of the works.

Should any active setts be recorded within 20m of development works, consideration will be given for the need to close the badger sett under licence.

4.8.9 Birds

Any vegetation clearance will be undertaken outside of the bird nesting season (March to August inclusive) . In addition, any works affecting areas of the site with potential to support nesting sand martins (i.e. sandy banks with sheer faces) will also be undertaken outside of the bird nesting season.

If there is a necessity for such clearance within the nesting season, a suitably qualified ecologist must carry out a series of nesting bird checks in advance of any works to ascertain breeding activity in affected areas.

Habitat compensation measures (as set out above) will serve to ensure the maintenance of foraging, shelter, and nesting opportunities within the site in the long-term. In the short-term, five nest boxes will be provided on suitable retained trees at the periphery of the site, in order to ensure replacement nesting opportunities are immediately available.

4.8.10 Invasive Species

Measures will be implemented throughout site works to safeguard against the spread of any invasive non-native species (such as cotoneaster, Japanese knotweed or rhododendron). Indeed, where possible such plants should be removed from the site (and disposed of appropriately, following an appropriate method statement).

4.8.11 Enhancement

The restoration of the site, following the decommissioning of the quarry, offers vast opportunities for habitat enhancement over and above the existing situation. Such enhancement measures will be detailed in a formal restoration plan, and will be drafted in line with the following principles regarding enhancement measures for habitats and for fauna.

Habitat

New habitat provision under the restoration plan should include provisions for trees, hedgerow, and shrub planting over and above the current situation. Where possible, these will be planted in association with other habitats of elevated value, such as wildflower grassland. Planting should comprise native species of local provenance. Where this is not possible, plants should be selected for their fruit, berry, or nectar bearing qualities. All landscape planting within the site will be managed for the benefit of wildlife.

Fauna

In order to increase opportunities of roosting bats and nesting birds, a number of bat and bird boxes will be incorporated in the restoration of the site, placed on trees of a suitable size. In addition, to increase opportunities

for invertebrates within the site, **i**nvertebrate boxes will be provided under the restoration plan. These boxes will be located in sheltered areas of new and retained vegetation, such as in association with hedgerows.

4.9 Residual effects

Residual effects are those that remain once the development proposals have been implemented i.e. with the mitigation and/or compensation measures in place. The main aim of ecological mitigation, compensation and enhancement is to ensure that processes are in place to avoid or reduce any negative effects of the development.

In the absence of mitigation, compensation and enhancement detailed, **Moderate** and **Minor** effects to features of **Local** value were realised. However, consideration of the measures outlined above has resulted in residual effects being considered to be **Not Significant**. In essence, this can be described as having no perceivable impacts on ecological features (habitat or species). Impacts may be beneath levels of perception, within normal bounds of variation.

Final restoration of the Site will include the replacement (and enhancement) of peripheral vegetation (scrub, grassland habitat and hedgerows) and the provision of areas for nesting birds (such as jackdaw and kestrel).

4.10 Cumulative impacts

Golder have reviewed the planning portal websites in addition to being involved in projects where EIAR is required within Kildare and specifically within reasonably close proximity to the Site. Stresslite Floors Ltd abounding the south of the Site have sought permission for continuance of use (PP Reg. No. 19/1363) has been lodged and is awaiting determination. However, the mitigation, compensation and enhancement measures committed within this EIAR (undertaken by Golder) will ensure that no perceivable cumulative impacts occur.

There are no other known activities or proposed activities at or within close proximity to the Application Site that would be likely to result in any significant cumulative impacts on the ecology of local area at this current time. It is therefore considered that no significant cumulative impacts would occur.

4.11 Summary and Conclusions

This chapter has evaluated the importance of the ecological resources present and defined the degree of significance of potential impacts resulting from the proposed development. The assessment approach has followed CIEEM (2018) and taken account of national planning policy, Structure and Local Plan policies in respect of nature conservation and protected species legislation in identifying appropriate avoidance, mitigation (including design mitigation) and compensation measures to take.

The assessment has concluded that no nature conservation sites will be directly or indirectly affected by the proposed development.

The habitat survey of the site identified the presence of some habitat of elevated ecological value; namely trees within the site, and hedgerows at site boundaries. Where possible the development design has sought to retain these habitats. Where retention of these habitats is not possible, mitigation and compensation measures are included within this chapter in order to ensure the maintenance of the value of these resources within the site.

Specific faunal survey work carried out identified the use of the site by a number of common and widespread species, whilst potential for the use of the site by species protected under both national and European legislation was also identified. Accordingly, suitable mitigation and compensation measures have been outlined in this Chapter, in order to safeguard these species throughout the development process.

In addition to mitigation for any potential impacts of the development on local flora and fauna, the opportunity has been taken to incorporate a number of enhancement measures within the proposed development, in order to improve habitat quality over and above the current situation, together with creating new opportunities for fauna within the site. These enhancements focus on the restoration of the site following the decommissioning

of the quarry. Minerals sites have the potential to enhance biodiversity and to provide a public benefit at the end of their working lives through restoration[11].

Detailed biodiversity mitigation, enhancement and management plans will be prepared for the site, in order to ensure the successful delivery and maintenance of the mitigation and enhancement measures outlined in this chapter. Specifically, a habitat management pan (HMP) will be prepared for the site.

When cumulatively considering the mitigation, compensation, and enhancement measures outlined within this chapter, it is considered that a net gain for biodiversity will be afforded over the medium to long term.

[11] https://service-rspb.boldlight.co.uk/app/uploads/sites/3/2016/03/Nature-After-Minerals-report.pdf

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