4

ECOLOGY AND BIODIVERSITY

4 ECOLOGY AND BIODIVERSITY

4.1 INTRODUCTION

This chapter of the remedial Environmental Impact Assessment Report (rEIAR) presents a retrospective assessment of the potential effects that may have occurred on ecological receptors as a result of activities at the existing Hudson Brothers Ltd (HBL) quarry site at Philipstown and Redbog, Co. Kildare ('the Site') between September 2020 and the present day.

4.1.1 TECHNICAL SCOPE

The focus of this assessment is centred on the establishment of likely baseline ecological conditions (flora, fauna and habitat composition) during the assessment period. This enables an assessment of potential impacts attributed to land take, disturbance and environmental emissions that occurred during this period. Historical mapping, historical aerial imagery, anecdotal evidence and site surveys have all been used to infer Site conditions during the assessment period. In any retrospective assessment, uncertainty may be a feature. As such, a conservative approach has been adopted to recognise potential impacts.

4.1.2 GEOGRAPHICAL AND TEMPORAL SCOPE

The geographical study area for the assessment covers the EIA boundary, which is approximately 95.8 ha. For certain aspects of the ecology and biodiversity assessment effects may extend beyond the EIA boundary and these have been documented where appropriate. In the context of this rEIAR, this EIA boundary contains lands which form the existing quarry area and some areas which extend beyond the working areas.

The expiry of the Planning Reg. Ref. 07/267 appropriate period was 18 September 2020, and as such the baseline of this rEIAR has been set at that appointed day, and the rEIAR process has assessed environmental impacts from that date to the present. This assessment period equates to approximately three and a half years and is identified as 'short-term' duration (those lasting one to seven years).

4.1.3 OVERVIEW OF SITE AND SURROUNDING AREA

The Site is located in the townlands of Philipstown and Redbog. The Site is located within an area of historical quarrying. The Site is accessed via a privately-owned track connecting to the N81 national road. The town of Blessington is located ca. 2 km south of the Site along the N81. The undulating land surrounding the Site slopes upwards in a north-westerly direction to the north of the Site, and away in a south-easterly direction to the south. The southern boundary of the Site lies adjacent to the Kildare-Wicklow County border. The quarry is accessed via Danker Lane (shared with other quarry operators) through lands owned by the Applicant in Co. Wicklow. The HBL Wicklow land is accessed via the N81 National Secondary Road (Figure 4-1).

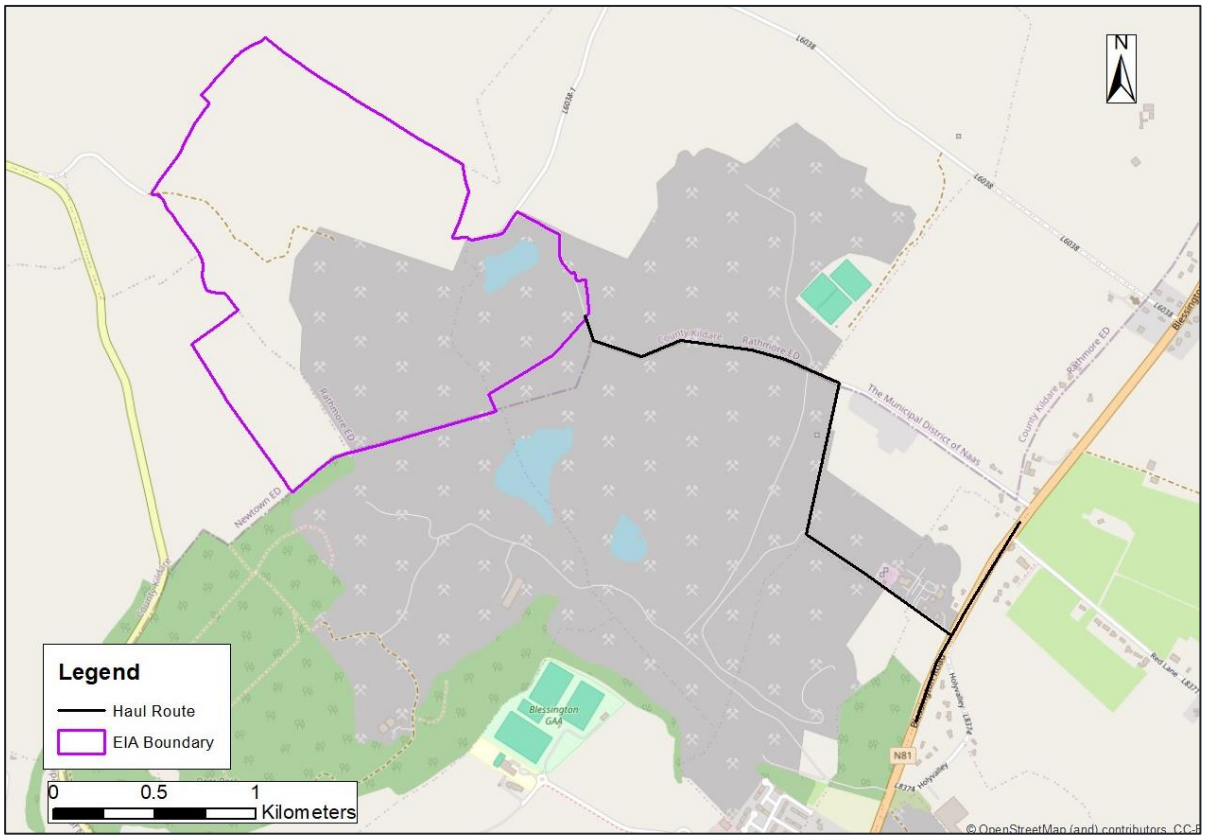

Figure 4-1 - EIA Boundary and Haul Route to the Site

The expiry of the Planning Reg. Ref. 07/267 appropriate period was 18 September 2020, and as such the baseline of this rEIAR has been set at that appointed day.

A detailed description of the Site and the activities that have been undertaken ('the Development') can be found in Chapter 2 of this rEIAR (Project Description).

4.2 LEGISLATIVE AND POLICY CONTEXT

The assessment of the likely impacts from the Development on ecological resources is in compliance with the following legislation and guidance:

4.2.1 LEGISLATION

- 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

- National Biodiversity Plan, 2017-2021;
- Ireland's National Strategy for Plant Conservation;
- Kildare County Development Plan 2023-2029, in particular Chapter 12 (Biodiversity and Green Infrastructure);
- County Kildare Biodiversity Plan 2009-2014;
- All Ireland Pollinator Plan 2015 – 2020; 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.
- Chanin, P. (2003) Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough.
- CIEEM (2022) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.
- DAFM (2022). Nitrates Explanatory Handbook. Department of Agriculture, Food and the Marine.
- EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Fossitt, J. (2000) A Guide to Habitats in Ireland. Heritage Council.
- Gurnell, J., Lurz, P., McDonald, R. and Pepper, H. (2009). Practical Techniques for Surveying and Monitoring Squirrels. Forestry Commission.
- Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.
- Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage,
- 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
- NRA (2008) Guidelines for the treatment of otters prior to the construction of national road schemes.
- NRA (2009a) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.
- 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 reports submitted with the 2020 planning application[1], environmental emissions monitoring results from the assessment period, as well as data gathered in 2023 for this substitute consent application. Conclusions are drawn as to whether (and to what extent) site conditions have changed during the assessment period, and whether these changes represent significant ecological impacts.

4.3.1 DESK STUDY

A review of freely available online data from the National Parks and Wildlife Services (NPWS) and of freely available data sets from the National Biodiversity Data Centre (NBDC) was undertaken in December 2023. A review of rare higher plants was undertaken from the NBDC. The NPWS mapviewer for Flora Protection Order (FPO) (2022) protected bryophytes[2] was also reviewed. The aim of the review was to identify designated sites/protected areas, irreplaceable/priority[3] habitats and legally protected and notable[4] species that may be present within the Development's Ecological Zone of Influence (EZoI)[5], including:

- European sites such as SACs, SPAs, and international Ramsar sites; within 15 km of the Development. This was extended to 20 km for SPAs based on the upper-range commuting

[1] Golder Associates Ireland Ltd (Golder) (2020) – EIAR and NIS

[2] https://www.npws.ie/maps-and-data/flora-protection-order-map-viewer-bryophytes

[3] Habitats that are considered irreplaceable or listed under Annex I on EU Habitats Directive 92/43/EEC.

[4] 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. Available at: https://www.npws.ie/publications/red-lists

[5] 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 Survey Area (described in Section 6.1.9), as well as the areas searched during the desk study.

distance of pink-footed and greylag geese (outlined in Scottish Natural Heritage (SNH), 2016);
- (NHAs[6] and pNHAs within 5 km of the Development, unless hydrological connectivity exists, in which case these would be considered up to a distance of 15 km.
- Protected or notable species within the 5-km of the Development, limited to records returned from within the last 20 years.
- 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); and
- The Irish Wetland Bird Survey (I-WeBS) dataset[7] was reviewed to identify I-WeBS survey sites within 2 km of the Development.

In addition to the resources above, the desk study made use of free online resources to assess the context of the land associated with the Development (all accessed November and December 2023):

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

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 correspond that a site is absent of notable flora or fauna.

4.3.2 FIELD SURVEYS – 2019/2020

Field surveys were conducted in 2019 and 2020 by O'Donnell Environmental, and Delichon Ecology in the case of hedgerow surveys specifically. Methodologies are provided below for each ecological receptor, as described in the 2020 EIAR (Golder, 2020).

4.3.2.1 Habitats

A walkover survey of the area was conducted by Golder on 13 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 accordance with those outlined in the following documents:

- Heritage Council (2011). Best Practice Guidance for Habitat Survey and Mapping;

[6] 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.

[7] Irish Wetland Bird Survey (2023) Available at: https://birdwatchireland.ie/our-work/surveys-research/research-surveys/irish-wetland-bird-survey.

- Phase 1 Habitat Survey methodology (JNCC, 2010)8; 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.

4.3.2.2 Hedgerow Survey

On behalf of Golder, Delichon Ecology carried out a site walkover survey on the morning and afternoon of Thursday 10 September 2020. The survey identified linear woodland habitats (i.e. treelines and hedgerows) within the proposed extension areas located to the north, west and south-west of the existing quarry footprint. Survey methodology was undertaken in accordance with the guidelines and parameters outlined in Hedgerow Appraisal System Best Practise Guidance on Hedgerow Surveying, Data Collation and Appraisal (Foulkes, et al., 2013). This allowed for a detailed and systematic assessment of each hedgerow and treeline within the extension boundary following fixed assessment criteria based on hedgerow management, growth form, integrity, structure and adjacent land use.

4.3.2.3 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 13 August 2019 in order to search for any features of bat roosting potential in trees. Inspections were carried out within daylight hours, using binoculars where necessary. Examples of the type of features searched for is outlined below:

- Split limbs; rot 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 sight, these were also recorded; and
- 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.

Badger Survey

To supplement the general protected species walkover, targeted badger (*Meles meles*) surveys were also undertaken at a sett on the periphery of the development site. The badger sett was inspected by O'Donnell Environmental on behalf of Golder on 19 August; 27 August and 7 September 2020. In addition, a camera trap was deployed at the sett location and recording was carried out for 23 days from 19 August to 10 September 2020. The camera was infra-red equipped

[8] Joint Nature Conservation Committee

to allow monitoring of activity by night as well as by day. The camera was triggered by movement, at which point a photo and five second video were recorded. The aim of the camera trap survey was to determine whether, and to what extent badgers were utilising the sett.

Breeding Bird Survey

Due to Covid-19 restrictions, appropriate surveys were not conducted prior to the submission of the 2020 planning application.

4.3.3 FIELD SURVEYS - 2023

A survey of the Site was carried out on the 14 and 15 November 2023. The survey comprised a multi-disciplinary site walkover, with a view to updating baseline data since the previous surveys in August 2019 and August 2020. The survey area included the existing quarry pit, as well as surrounding lands within the EIA boundary as shown in Figure 4-2. The survey area included a 50 m buffer[9] to account for the potential presence of badger setts outside the EIA boundary. It should be re-emphasised that the Applicant is applying concurrently for future expansion of the quarry as a quarry. This process is separate from the substitute consent process and is outside the scope of this report, which is focused on the area within the substitute consent boundary.

The scope of the surveys included:

- Habitats – in accordance with guidance by Smith et al. (2011) and Fossitt (2000), but with a focus on comparing the habitat assemblage with that reported in the 2020 EIAR (Golder, 2020).
- Protected 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.
  - Bats – potential bat roost assessment (PBRA) of trees in accordance with Collins (2023) and Marnell *et al.* (2022) – methodology as described earlier for 2019 surveys.
    - Potential roost features (PRFs) were classified in accordance with Collins (2023):
    - **PRF-I** – PRF is only suitable for individual bats or very small numbers of bats, either due to size or lack of suitable surrounding habitats.
    - **PRF-M** – PRF is suitable for multiple bats and may therefore be used by a maternity colony.
  - 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 wintering birds were made – particularly any in association with waterbodies, or any waterfowl grazing on grassland.
- The suitability of habitats for the above-mentioned protected species was also assessed.

[9] In accordance with guidance (NRA, 2006) recommending surveys within 50m of any proposed works.

Field surveys and reporting was carried out by WSP ecologists Steven Tooher ACIEEM (Principal Ecologist) and Lisa O'Dowd (Consultant Ecologist), who have 8 and 3 years' experience respectively of habitat and protected species survey assessments. Both surveyors are at least 'capable' [10] in accordance with CIEEM's competency framework.

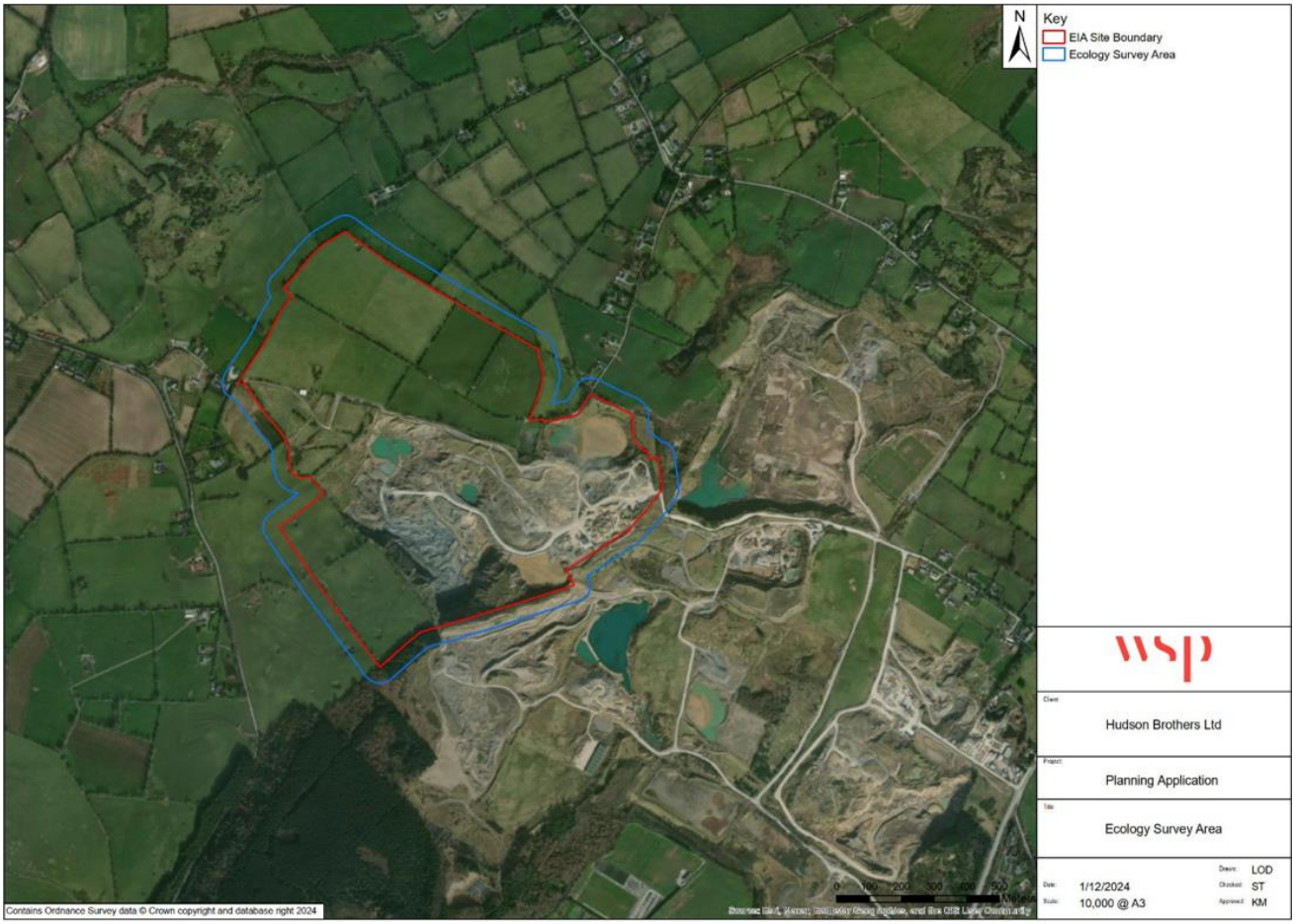

Figure 4-2 - Ecology Survey Area

Aquatic Ecology

The assessment considers the potential for hydrological connectivity between the Site and surface water features, and also considered potential impacts to aquatic flora/fauna and habitat receptors. It is important to note that no watercourses cross the Site, and apart from silt lagoons associated with the operations of the quarry, there was no alteration of any open waterbodies during the assessment period.

[10] Using CIEEM's competency level framework (Available at cieem.net/wp-content/uploads/2022/01/Competency-Framework-2022-Web.pdf) a surveyor deemed as capable has the knowledge and experience to carry out standard relevant tasks confidently and consistently without supervision.

4.3.4 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.

4.3.5 SURVEY LIMITATIONS

Details on survey limitations are provided in Section 4.4.5. Limitations are discussed after the results, because their significance is related to the existing conditions onsite, which are described in the results section.

4.3.6 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 Importance	European Site including SAC, Site of Community Importance (SCI) or SPA Features essential to maintaining the coherence of the European Network[11]. 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)[12] 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).

[11] See Article 3 and 10 of the Habitats Directive.

[12] 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.

Importance	Ecological Valuation
	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).[13]
National Importance	Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. 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)[14] of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas'[15] of the habitat types listed in Annex I of the Habitats Directive.
County Importance	Area subject to a Tree Preservation Order. Area of High Amenity[16], or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level)[17] of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;

[13] Note that such waters are designated based on these waters' capabilities of supporting salmon, char and whitefish *Coregonus.*

[14] 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.

[15] 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)

[16] 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.

[17] 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 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. 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.
Local Importance (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)[18] 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 Importance (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.

[18] 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 'IEFs' for which impact assessment is required during subsequent stages of the process. Impacts on these features would not be considered significant.

4.3.7 IMPACT ASSESSMENT

The potential for impacts on IEFs has been assessed considering the habitats and species that are likely to have been affected by the Development during the assessment period.

CIEEM (2022) defines an ecologically **Significant Impact** 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 and 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.

4.3.8 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.

4.3.8.1 Biodiversity Enhancement – Recent Policy

Kildare County Development Plan 2023-2029 (Chapter 12) has 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 (2023) on the implementation of biodiversity enhancement (BE) in Ireland. Two key recommendations include:

- The mitigation hierarchy should always be followed sequentially. The primary emphasis should always be on avoidance; and
- BE should be mandatory for all large-scale developments, e.g. infrastructure projects, renewable energy, or those that require Environmental Impact Assessment.

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 AND SUBSEQUENT CONDITIONS (2020 TO PRESENT)

4.4.1 DESIGNATED AND NOTABLE CONSERVATION SITES

Table 4-4 lists eight European sites of nature conservation importance located within the 20 km EZoI of the Development. For European sites a Remedial Appropriate Assessment Screening Report (rAAS) accompanies this substitute consent application. Figure 4-3 shows the proximity of designated sites to the Development.

There are no NHAs located within 5 km of the Development, with the closest being Hodgestown Bog NHA, located approximately 20.2 km north-west of the site.

Table 6.2 also lists three pNHAs within 5 km of the Development. Two of these, Red Bog, Kildare pNHA and Poulaphouca Reservoir pNHA are the nearest pNHAs to the Site. Given that these pNHAs are designated as European sites, which carry a higher level of protection, the impact assessment for these sites is covered separately within the rAAS which accompanies this application. Information and conclusions from the rAAS are summarised where appropriate.

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)	SAC boundary[19] adjacent to Substitute Consent Boundary, but separated by a local (L) road. 150 m north-east (from nearest active area – haul road)	Per Geological Survey Ireland (GSI) Spatial Resources[20], the Site and this SAC are situated within the same groundwater body (European Code: IE_EA_G_085). According to GSI, Red Bog SAC is a Groundwater-Dependent Terrestrial Ecosystem (GWDTE) within this groundwater body. However, Chapter 7 clarifies that the water associated with this SAC is perched, and not connected with the above groundwater body. Chapter 7 of this rEIAR (Water) also shows that groundwater flows southwest from beneath the SAC, and leaves the quarry in a north-westerly direction. Furthermore, evidence is provided to show that the Development has not excavated below the groundwater table. As such, it is concluded that there is **no groundwater connectivity.** The SAC boundary is more than 100 m from the nearest source of dust emissions, which according to IAQM[21] (2016) is outside the range in which significant impacts are likely to occur. The haul road in question is separated from the SAC by an earthen berm. Further detail on the likely impacts of dust emissions from the Site on this SAC are discussed later in the report. At this stage it is concluded that there is **potential connectivity for dust emissions**	▪ Transition Mires [7140]
Poulaphouca Reservoir SPA (004063) Poulaphouca Reservoir pNHA (000731)	2.2 km south-east	**No hydrological connectivity.** The qualifying species of this SPA are primarily associated with large bodies of water, which are present onsite in the form of (albeit small) settlement lagoons. The magnitude of disturbance associated with the activities at the Site is such that the lagoons are completely devoid of	▪ Greylag Goose [A043] ▪ Lesser Black-backed Gull *Larus fuscus* [A183]

[19] It should be noted that the SAC boundary surrounds the main area of qualifying habitat (transition mire), as well as up to 240 m of peripheral improved agricultural grassland.

[20] https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228 (accessed 21 November 2023)

[21] Institute of Air Quality Management

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests [Habitats/Birds Directive Code, where applicable]
		vegetation and do not provide a foraging resource for waterfowl (see Section 4.3.3). Greylag goose is known to occasionally forage away from water on agricultural grassland, which is present at the Site around the periphery of the existing quarry pit. 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. The core foraging range for greylag geese is accepted as being 20 km (SNH, 2016). Given that the Development is within the core foraging range of greylag geese, and given the presence of suitable foraging habitat on adjacent lands, **there is functional connectivity** with this SPA. There is no functional connectivity for lesser black-backed gull.	
Kilteel Wood pNHA (1394)	4.5 km north	**No hydrological connectivity.** The site is proposed as a NHA for the woodland habitat that is present onsite. there is therefore **no functional connectivity** with the Development.	▪ Deciduous woodland
Wicklow Mountains SAC (002122)	5 km south-east	**No hydrological connectivity.** This SAC is designated for habitats only; there is therefore **no functional connectivity** with the Development.	▪ 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]

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests [Habitats/Birds Directive Code, where applicable]
			▪ 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]
Wicklow Mountains SPA (004040)	8.3 km south-east	**No hydrological connectivity.** According to SNH (2016), Merlin nests are separated by a mean distance of ca. 500 m, and a maximum of 1.5 km. Peregrine falcon nests are separated by a mean distance of ca. 3 km, and a maximum of 6.5 km. In a study of Co. Wicklow peregrine populations, Burke *et al.* (2015) found that the mean distance between nests was 5.7 km. The Development is therefore out of the range in which SPA populations would nest at the Site. There is **no functional connectivity** for nesting merlins or peregrine falcons. According to SNH (2016), the core foraging range for merlin is 5 km, and is 2 km for peregrine falcon. Peregrines have however been recorded foraging at a maximum of 18 km from their nest. Natural England (2020) states that peregrine falcons will defend a nesting territory ranging from 2-9 km from their nest. For this reason, Natural England recommends a zone of influence of 10 km for peregrine falcon. The Development is within the range in which SPA populations of peregrine falcon may forage and defend a nesting territory. As such, **there is functional connectivity for foraging peregrine falcon. There is no functional connectivity for foraging merlin.** Previous reporting, as well as information provided to WSP by the Applicant, indicates that peregrine falcons regularly nest at the top of one of the walls of the quarry pit. **It should be noted that the presence of peregrine falcons at the Site does not represent connectivity with Wicklow Mountains SPA. For**	▪ Merlin *Falco columbarius* [A098] ▪ Peregrine falcon *Falco peregrinus* [A103]

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests [Habitats/Birds Directive Code, where applicable]
		the reasons outlined above, these individuals are not associated with the population for which the SPA is designated. As such, any impact to onsite populations of peregrine falcon does not represent an impact to the SPA. Onsite populations are addressed separately under Breeding Birds.	
Glenasmole Valley SAC (001209)	14.3 km north-east	**No hydrological connectivity.** Petrifying springs are GWDTEs, but this SAC is not in the same groundwater body as the Site. There is **no groundwater connectivity**. This SAC is designated for habitats only; there is therefore **no functional connectivity** with the Development.	▪ 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]
Ballynafagh Lake SAC	18.1 km north-west	**No hydrological connectivity.** Alkaline fens are GWDTEs, but this SAC is not in the same groundwater body as the Site. There is **no groundwater connectivity**. Given that there is no hydrological connectivity, and given the distance between the SAC and the Site, there is therefore **no functional connectivity**.	▪ Alkaline fens [7230] ▪ Desmoulin's Whorl Snail *Vertigo moulinsiana* [1016] ▪ Marsh Fritillary *Euphydryas aurinia* [1065]
Ballynafagh Bog SAC	18.4 km north-west	**No hydrological connectivity.** This SAC is designated for habitats only; there is therefore **no functional connectivity** with the Development.	▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150]
Pollardstown Fen SAC	18.7 km west	**No hydrological connectivity.** Petrifying springs and alkaline fens are GWDTEs, but this SAC is not in the same groundwater body as the Site. There is **no groundwater connectivity**.	▪ Calcareous fens with *Cladium mariscus* and species of the Caricion davallianae [7210] ▪ Petrifying springs with tufa formation (Cratoneurion) [7220] ▪ Alkaline fens [7230] ▪ Geyer's Whorl Snail *Vertigo geyeri* [1013]

Site Name and Code	Distance from Development	Connectivity	Qualifying Interests [Habitats/Birds Directive Code, where applicable]
		The fauna associated with this SAC are species of snails. Given that there is no hydrological connectivity, and given the distance between the SAC and the Site, there is therefore **no functional connectivity**.	▪ Narrow-mouthed Whorl Snail *Vertigo angustior* [1014] ▪ Desmoulin's Whorl Snail [1016]
Moud's Bog SAC	16.4 km west	**No hydrological connectivity.** This SAC is designated for habitats only; there is therefore **no functional connectivity** with the Development.	▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150]

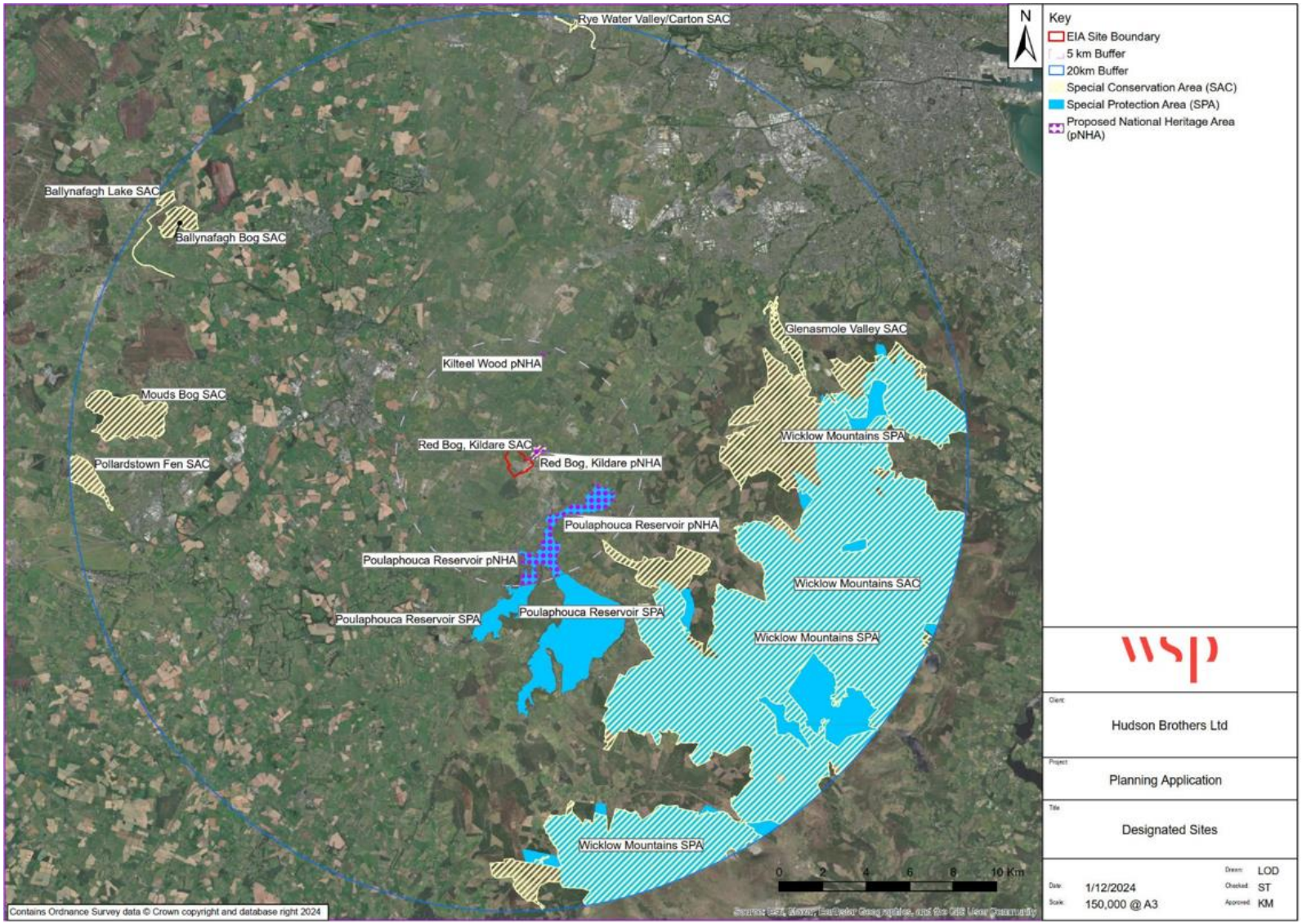

Figure 4-3 - Designated Sites

4.4.2 DESK STUDY

This section presents the available historical species records within 5 km of the Development (as per buffer shown in Figure 4-3) that have been submitted within the last 20 years.

Flora

The desk study returned 363 records of conifers, flowering plants, mosses, liverworts and horsetails. None of these species are listed as Vulnerable or above on the IUCN Red List, and nor are they afforded any protection.

Bats

Historical records for brown long-eared bat (*Plecotus auritus*), Daubenton's bat (*Myotis daubentonii*), pipistrelle (*Pipistrellus* sp.), soprano pipstrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*) exist within 5 km of the Site. All Irish bat species are protected under the WA, and listed under Annex IV of the Habitats Directive.

Birds

The desk study returned records of 101 bird species. Of these, 48 are afforded protection under the Birds Directive and/or are listed on the BoCCI Red or Amber list (Gilbert, et al., 2021) – see Table 4-5. All wild birds are protected under the WA.

Table 4-5 - Desk Study – Protected and Notable Bird Species

Common Name	Scientific Name	Designation and/or Conservation Status
Little Egret	*Egretta garzetta*	Birds Directive - Annex I
Red-footed Falcon	*Falco vespertinus*	Birds Directive - Annex I
Kingfisher	*Alcedo atthis*	Birds Directive - Annex I BoCCI - Amber List
Whooper Swan	*Cygnus cygnus*	Birds Directive - Annex I BoCCI - Amber List
Greater White-fronted Goose	*Anser albifrons*	Birds Directive - Annex I/II/III BoCCI - Amber List
Golden Plover	*Pluvialis apricaria*	Birds Directive - Annex I/II/III BoCCI - Red List
Goosander	*Mergus merganser*	Birds Directive - Annex II BoCCI - Amber List
Goldeneye	*Bucephala clangula*	Birds Directive - Annex II BoCCI - Red List
Curlew	*Numenius arquata*	Birds Directive - Annex II BoCCI - Red List
Lapwing	*Vanellus vanellus*	Birds Directive - Annex II BoCCI - Red List
Pheasant	*Phasianus colchicus*	Birds Directive - Annex II/III[Note 1]
Coot	*Fulica atra*	Birds Directive - Annex II/III BoCCI - Amber List

Common Name	Scientific Name	Designation and/or Conservation Status
Teal	*Anas crecca*	Birds Directive - Annex II/III BoCCI - Amber List
Tufted Duck	*Aythya fuligula*	Birds Directive - Annex II/III BoCCI - Amber List
Snipe	*Gallinago gallinago*	Birds Directive - Annex II/III BoCCI - Red List
Woodcock	*Scolopax rusticola*	Birds Directive - Annex II/III BoCCI - Red List
Shoveler	*Spatula clypeata*	Birds Directive - Annex II/III BoCCI - Red List
Red Grouse	*Lagopus lagopus*	Birds Directive - Annex II/III BoCCI - Red List
Barn Swallow	*Hirundo rustica*	BoCCI - Amber List
Kestrel	*Falco tinnunculus*	BoCCI - Amber List
Sandpiper	*Actitis hypoleucos*	BoCCI - Amber List
Starling	*Sturnus vulgaris*	BoCCI - Amber List
Tree Sparrow	*Passer montanus*	BoCCI - Amber List
Great Cormorant	*Phalacrocorax carbo*	BoCCI - Amber List
Great Crested Grebe	*Podiceps cristatus*	BoCCI - Amber List
House Martin	*Delichon urbicum*	BoCCI - Amber List
House Sparrow	*Passer domesticus*	BoCCI - Amber List
Lesser Black-backed Gull	*Larus fuscus*	BoCCI - Amber List
Mute Swan	*Cygnus olor*	BoCCI - Amber List
Wheatear	*Oenanthe oenanthe*	BoCCI - Amber List
Ringed Plover	*Charadrius hiaticula*	BoCCI - Amber List
Sand Martin	*Riparia riparia*	BoCCI - Amber List
Sky Lark	*Alauda arvensis*	BoCCI - Amber List
Black-headed Gull	*Larus ridibundus*	BoCCI - Amber List
Goldcrest	*Regulus regulus*	BoCCI - Amber List
Grey Wagtail	*Motacilla cinerea*	BoCCI - Amber List
Little Plover	*Charadrius dubius*	BoCCI - Amber List
Willow Warbler	*Phylloscopus trochilus*	BoCCI - Amber List
Swift	*Apus apus*	BoCCI - Red List
Red Kite	*Milvus milvus*	BoCCI - Red List
Redshank	*Tringa totanus*	BoCCI - Red List
Yellowhammer	*Emberiza citrinella*	BoCCI - Red List
Meadow Pipit	*Anthus pratensis*	BoCCI - Red List

Common Name	Scientific Name	Designation and/or Conservation Status
Redwing	*Turdus iliacus*	BoCCI - Red List
Greylag Goose	*Anser anser*	Invasive Species - S.I. 477/2011[Note 2] Birds Directive - Annex II/III BoCCI - Amber List

Note 1: *Pheasant does not fulfil 'notable' criteria[4] but is retained for visibility as it is a ground-nesting species (relevant in this case because grassland has been removed during the assessment period).*

Note 2: *According to Burke et al.* (2022)*, much of Ireland's resident greylag goose population is descended from birds released in the 20th century. This group is referred to here as the 'feral' population. The term 'naturalised' may be more appropriate (or perhaps naturalised introduced) and the historic status of breeding greylag geese in Ireland is not fully clear. Although this population falls under the monitoring remit of the Irish Rare Breeding Birds Panel as a non-native breeding species, the true distribution and changes in numbers of the feral greylag goose population in Ireland has only been monitored intermittently and is not well understood. The other population is comprised of winter visitors that breed in Iceland. It is not possible to differentiate between individuals from these populations in the field, unless ringing data can be obtained. Greylag goose is a qualifying feature of Poulaphouca Reservoir SPA, and according to Burke et al.* (2022)*, the population in Poulaphouca Reservoir is Icelandic in origin. As such, in the context of the Development, records are assumed to be associated with the same population and therefore do not represent the presence of invasive species.*

Mammals

The desk study returned records of 21 mammal species (see Table 4-6). Of these, 8 are afforded protection under the Habitats Directive and/or the WA. There are 5 species that are designated as invasive under S.I. 477/2011.

Table 4-6 - Desk Study – Mammals

Common Name	Scientific Name	Designation and/or Conservation Status
Otter	*Lutra lutra*	Habitats Directive - Annex II/IV Protected Species - Wildlife Acts
Pine Marten	*Martes martes*	Habitats Directive - Annex V Protected Species - Wildlife Acts
Badger	*Meles meles*	Protected Species - Wildlife Acts
Pygmy Shrew	*Sorex minutus*	Protected Species - Wildlife Acts
Red Squirrel	*Sciurus vulgaris*	Protected Species - Wildlife Acts
Red Deer	*Cervus elaphus*	Protected Species - Wildlife Acts
Hedgehog	*Erinaceus europaeus*	Protected Species - Wildlife Acts
Irish Hare	*Lepus timidus hibernicus*	Protected Species - Wildlife Acts
Rabbit	*Oryctolagus cuniculus*	None
Feral Ferret	*Mustela furo*	None
Feral Goat	*Capra hircus*	None
Hazel Dormouse	*Muscardinus avellanarius*	None
House Mouse	*Mus musculus*	None

Common Name	Scientific Name	Designation and/or Conservation Status
Red Fox	*Vulpes vulpes*	None
Wood Mouse	*Apodemus sylvaticus*	None
American Mink	*Mustela vison*	Invasive Species - S.I. 477/2011
Brown Rat	*Rattus norvegicus*	Invasive Species - S.I. 477/2011
Grey Squirrel	*Sciurus carolinensis*	Invasive Species - S.I. 477/2011
Fallow Deer	*Dama dama*	Invasive Species - S.I. 477/2011
Sika Deer	*Cervus nippon*	Invasive Species - S.I. 477/2011

Herpetofauna

The desk study returned three records of herpetofauna. All herpetofauna are protected under the WA. Common frog is listed under Annex V of the Habitats Directive (see Table 4-7).

Table 4-7 - Desk Study - Herpetofauna

Type	Common Name	Scientific Name	Designation and/or Conservation Status
Amphibian	Common Frog	*Rana temporaria*	Habitats Directive - Annex V Protected Species - Wildlife Acts
Amphibian	Smooth Newt	*Lissotriton vulgaris*	Protected Species - Wildlife Acts
Reptile	Common Lizard	*Zootoca vivipara*	Protected Species - Wildlife Acts

Invertebrates

The desk study returned five notable invertebrate species (see Table 4-8).

Table 4-8 - Desk Study - Notable Invertebrates

Type	Common Name	Scientific Name	Designation and/or Conservation Status
Butterfly	Wall Butterfly	*Lasiommata megera*	IUCN Red List - Endangered
Bee	Small Sallow Mining Bee	*Andrena (Andrena) praecox*	IUCN Red List - Vulnerable
Bee	Buff Mining Bee	*Andrena (Melandrena) nigroaenea*	IUCN Red List - Vulnerable
Bee	Gooden's Nomad Bee	*Nomada goodeniana*	IUCN Red List - Endangered
Bee	Blunt-jawed Nomad Bee	*Nomada striata*	IUCN Red List - Endangered

4.4.3 SURVEY RESULTS (2019/2020)

The information presented in this section has been adapted from the EIAR submitted in 2020 (Golder, 2020).

4.4.3.1 Habitats

The Site was found to be almost entirely comprised of an active quarry, with surrounding habitats including improved grassland, trees, hedgerows, and trees (Table 4-9). The 2020 habitat map is presented in Figure 4-4. No protected habitats or flora were recorded during the 2019/2020 survey.

Table 4-9 – Habitats recorded during 2019/2020 surveys (nomenclature as per Fossitt, 2000)

Habitat	Code
Mesotrophic Lakes	FL4
Artificial Lakes and Ponds	FL8
Improved Agricultural Grassland	GA1
Conifer Plantation	WD3[22]
Scrub	WS1
Hedgerows	WL1
Treelines	WL2
Exposed Sand, Gravel and Till	ED1
Spoil and Bare Ground	ED2
Recolonising Bare Ground	ED3
Active Quarries and Mines	ED4
Buildings and Artificial Surfaces	BL3

[22] Having been to site, WSP considers WD3 to be the correct habitat classification, but the corresponding title should be 'Mixed Conifer Woodland'. Golder's classification of 'Conifer Plantation' should be coded WD4. WSP considers the code to be correct but the title erroneous.

Figure 4-4 - Habitat Map (Golder, 2020)

Active Quarries and Mines - ED4

The centre and south-east of the Site was dominated by bare ground, associated with the footprint of the quarrying activities. Whilst the vast majority of the active quarry footprint was 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 were able to survive.

Improved Agricultural Grassland - GA1

A number of agricultural fields were present within the north and south-west of the Site. The grassland was dominated by grasses, with species including Yorkshire-fog (*Holcus lanatus*), cock's-foot (*Dactylis glomerata*), crested dog's-tail (*Cynosurus cristatus*), false oat-grass (*Arrhenatherum elatius*), sweet vernal-grass (*Anthoxanthum odoratum*), and perennial rye-grass (*Lolium perenne*). Very few herbaceous plants were recorded. Where present, these species were more prevalent at field boundaries, and included species such as thistle (*Cirsium* sp.), chickweed (*Stellaria media*), common nettle (*Urtica dioica*) and yarrow (*Achillea millefolium*).

The fields within the north of the Site were recorded to be subject to more intensive management than the field in the south-west. The south-western field supports a tussocky sward up to 30 cm in height, whilst the fields within the north of the Site were generally grazed to ground level, with a sward up to a maximum of 10 cm in height.

Treelines - WL2

Ash (Fraxinus excelsior) was the most dominant species recorded. Bracket fungus was observed on a number of the trees. No understorey was recorded associated with the treelines, whilst ground flora was recorded to be consistent with species present in the adjacent grassland.

Scrub - WS1

Areas of scattered scrub were present within the Site. Where this scrub was associated with field boundaries, it was considered likely to be representative of defunct hedgerows. Scrub species recorded within the Site included blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), and gorse (*Ulex europaeus*).

Hedgerows - WL1

Hedgerows marked field boundaries within the Site. These hedgerows were largely recorded as outgrown and leggy in nature, dominated by hawthorn, with some gorse.

The hedgerows were found to vary in structure, with some being relatively dense, whilst others did not appear to be subject to regular management and had become gappy and defunct in nature, beginning to resemble individual trees. A number of the hedges were set within shallow depressions.

Hedgerow Survey

In summary, this assessment found that the majority of hedgerows and treelines within the study area were located upon or adjoined by earth banks and were adjoined by improved grassland habitats. All hedgerows surveyed were single line hedges, were not stock proof and were adjoined by a small earth bank, typically less than 1 m in height. Most earth banks exhibited localised erosion and exposure due tracking or sheltering by sheep.

Most hedgerow shrubs within the Site were deemed to be overgrown, with the average hedgerow height being 2.5 m and 4 m. Hedgerows were gappy within the Site; on average 10-25% of the hedgerows surveyed no longer had a cover of hedgerow shrubs. In addition, all hedgerows within the Site had not received management in the recent past, with only one hedgerow exhibiting management in the short-term. The condition of most hedgerows surveyed were classified as either relict or overgrown.

Hedgerows within the Site were dominated by hawthorn shrubs with occasional occurrences of semi-mature ash trees, sycamore, beech, gorse and elder. Hedgerow ground flora was poor, with an absence of vernal or woodland ground flora species. Some hedgerows supported localised abundances of dense nettle growth spreading from the base. The site supports two treeline habitats comprising tall semi-mature and maturing ash trees. All hedgerows and treelines within the Site were bordered by post and wire (including barbed wire) fencing.

4.4.3.2 Fauna

Badger

One badger sett was noted in a field boundary in the south-western portion of the Site. It was deemed to be an 'outlier' sett[23], and appeared in recent use. It was subjected to an infrared camera survey between 27 August and 7 September, which did not detect the presence of badgers at the sett.

Other Terrestrial Mammals

During the camera survey of the badger sett, incidental recordings of fox (*Vulpes vulpes*), red squirrel (*Sciurus vulgaris*), Sika deer (*Cervus nippon*), rabbit (*Oryctolagus cuniculus*) and grey squirrel (*Sciurus carolinensis*) were made.

Of these, only red squirrel is afforded protection under the WA. Grey squirrel and Sika deer are designated as invasive species under the Birds and Natural Habitats Regulations (S.I. 477/2011).

Bats

A number of trees within the Site were deemed to have the potential to support roosting bats, in particular the trees in field boundaries in the south-west of the Site.

Birds

A small number of bird species were recorded within the Site at the time of the survey, largely associated with the grassland, hedgerows and trees within the west and north of the Site. Species recorded include woodpigeon (*Columba palumbus*) and pheasant (*Phasianus colchicus*). In particular, a number of birds were observed associated with a hedgerow in the north of the Site, including blue tit (*Cyanistes caeruleus*), chaffinch (*Fringilla coelebs*), chiffchaff (*Phylloscopus collybita*) coal tit (*Periparus ater*), robin (*Erithacus rubecula*), and treecreeper (*Certhia familiaris*), whilst buzzard (*Buteo buteo*) was observed flying over the land in the north of the Site. In addition, there are anecdotal reports of peregrine falcons (*Falco peregrinus*) nesting on one of the cliff faces of the quarry, although none were observed at the time of survey.

4.4.4 SURVEY RESULTS (2023)

This section presents the data gathered during the survey in November 2023.

4.4.4.1 Habitats

The assemblage of habitats onsite in 2023 was found to broadly correspond to that described in Golder (2020).

A small number of discrepancies were noted, as described in the following text, with reference to the annotations in Figure 4-5. It should be noted that not all discrepancies represent changes in

[23] Outlier setts are typically located on the periphery of a badger territory. They are smaller and experience comparatively little use relative to other sett types.

circumstance during the assessment period – they may have simply been missed during the previous suite of surveys and reporting.

Figure 4-5 - Annotated 2020 Habitat Map (adapted from Golder, 2020).

A. This ring of scrub surrounds a small depression, in which the surface is gravelled and what appears to be a manhole chamber is in place. It is labelled as a spring in historic mapping by Ordnance Survey Ireland (OSI, 2023), although it is not included in the database of springs maintained by Geological Survey Ireland (GSI, 2023). Downhill, approximately 60 m to the south-west, a small area (ca. 140 m^2) of standing water was observed (refer to 'A1' in Figure 4-5). This was considered most appropriately classified as another example of mesotrophic lakes (FL4) (see Figure 4-6). The pathway between this feature and the spring was surfaced with gravel, suggesting that spring discharge is piped along this route.

    a. It should be noted that this arrangement is evident in freely-available aerial imagery (Google Earth in this case) as far back as 2009. As such it does not represent a change in circumstance during the assessment period.

b. Anecdotal evidence from the Applicant and from other WSP staff who have visited the Site in recent years suggests that standing water in this area is not always present.

B. The grassland habitat in this area was classified as GA1 (improved agricultural grassland) in 2020. In 2023 it was noted that this area is dominated by dry meadows and grassy verges (GS2), which is typical for what was once an improved pasture but has subsequently been left alone for some time. Occasional patches of wet grassland (GS4) were noted in lower-lying areas and fringing areas of the above-mentioned pond, marked by a notable abundance of soft rush (*Juncus effusus*). GS4 accounted for ca. 10% of the coverage within this area – the rest (ca. 90%) was GS2.

C. A new lagoon has been created in this area since 2020, labelled 'Pond K2', and is used as a supply of water to the aggregate plant (please refer to Chapter 7 (Water) for a detailed description of how the Site utilises and recycles water). The changes to this lagoon over the assessment period are shown in Figure 4-7.

D. This area of GA1 has been subject to earthworks recently – between January and October 2023 (see Figure 4-7). This corner of the Site is now occupied by spoil and bare ground (ED2), and the grassland has been almost completely removed. The area of GA1 that has been removed is approximately 1.12 ha.

E. Pond K is no longer in use and has been backfilled since the surveys in 2020 (see Figure 4-7).

F. The shape of this lagoon has changed – the area that extends out to the south as shown has been backfilled (see Figure 4-7).

G. A new lagoon has been created in this area – this is a settlement lagoon that allows sediment to fall out of solution before the water is circulated back to Pond K2 (please refer to Chapter 7 (Water) for more detail) (see Figure 4-7).

Figure 4-6 - Infrastructure at the source of the 'spring' (left) and example of FL4 downhill (right)

Figure 4-7 - Site Aerials in June 2020, March 2022, January 2023 and October 2023 (Images from Google Earth, ESRI and site surveys).

Mixed Conifer Woodland (WD3)

Golder (2020) labelled this as a 'Conifer Plantation', which is normally assigned the Fossitt code WD4. WSP considers WD3 to be the correct habitat classification – this area of woodland did not appear to be part of the same forestry regime as (e.g.) the trees in Glen Ding Forest, which are in more distinct rows and appear much more homogenous in aerial imagery. The area of WD3 shown in Figure 4-4 was found to be dominated by Sitka spruce (*Picea sitchensis*), but several deciduous tree specimens were also observed, including hawthorn and ash. Spruce trees were tall (>10 m) but not particularly thick (trunk diameter <40 cm). This area was likely planted as a conifer plantation, but is now somewhat distant from the main body of Glen Ding Forest and therefore not subject to the same intensity of management.

Artificial Lakes and Ponds (FL8)

The lagoons within the quarry pit were found to be completely devoid of vegetation – an indication of the magnitude of disturbance associated with the activities in this area. Accordingly, their suitability

for fauna is considered extremely low, which is supported by the lack of sightings of any fauna associated with these waterbodies during the surveys in November 2023.

Red Bog, Kildare SAC and pNHA

The majority (ca. 80%) of the area within the SAC and pNHA is occupied by improved agricultural grassland (GA1), and grazing cattle were observed on the land at the time of survey. The qualifying habitat (the habitat for which the SAC was designated), 'transition mires and quaking bogs', is at least 160 m from the nearest part of the substitute consent boundary. The nearest part of the Site where activity was likely occurring during the assessment period is a haul road, ca. 270 m from qualifying habitat associated with the SAC/pNHA.

4.4.4.2 Fauna

Badger

Six potential setts[24] were identified in field boundaries in the lands surrounding the existing quarry pit. Five of these were associated with fields to the north, and one with fields to the south-west. Precise locations, and details on each potential sett can be provided in a confidential badger appendix, which can be provided to An Bord Pleanála on request. In the context of this substitute consent application, no setts, nor any other evidence of badger activity, were identified within the existing quarry pit. The potential sett identified in the south-west was ca. 280 m from the area where recent earthworks have commenced (refer to 'D' in Figure 4-5).

Other Terrestrial Mammals

Excluding the potential badger setts described above, a total of seventeen mammal burrows were identified along field boundaries in the lands peripheral to the existing quarry pit. Eight of these were classified as rabbit burrows, owing to the presence of fresh droppings at the entrance. Eight were considered likely to be attributed to rabbits also, but were lacking droppings to confirm. A wood mouse burrow (*Apodemus sylvaticus*) was identified along the northern boundary. A live rabbit was observed by the north-western boundary. Two Sika deer were observed emerging from the area of scrub surrounding the spring to the north of the Site. A herd of ca. 20 feral goats was observed grazing in the area marked as 'B' in Figure 4-5.

None of these species are afforded any protection under the WA or any other Irish or European legislation.

Sika deer are designated as invasive under Schedule 3 of S.I. 477/2011. Feral goats are not legally-designated, but are often considered invasive in an ecological context due to their rigorous grazing habits.

The field boundaries that were deemed suitable for the species described above, were also considered suitable for other protected mammals noted in the desk study. This includes pygmy shrew, hedgehog, Irish hare, red squirrel and pine marten. Although no direct evidence of their

[24] These were classified as 'potential' setts owing to their size and shape (i.e. they were large enough, and exhibited the typical D-shaped entrance associated with badger setts), but it is acknowledged that setts are often abandoned and become occupied by other species, such as rabbit or fox.

presence onsite was observed, habitats onsite were considered suitable for foraging, commuting and resting (i.e., for pine marten dens, squirrel dreys, hare forms etc.).

One suitable pine marten denning site was identified in one of the hedgerows to the southwest, in the form of a substantial cavity in an ash tree.

Bats

Fifteen trees within the survey area were deemed to have the potential to support roosting bats. Thirteen of these were in hedgerows or treelines in the south-west, and the remaining two in hedgerows or treelines in the north. In accordance with Collins (2023), four of these were classified as -M, by virtue of their perceived potential to accommodate multiple roosting bats. The rest were classified as PRF-I. The locations of these are provided in Figure 4-8. The distance from the nearest PRF to the area where recent earthworks have commenced (refer to 'D' in Figure 4-5) was ca. 125 m.

Birds

Approximately forty sand martin (*Riparia riparia*) burrows (nests) were noted at the top of a cliff face in the northernmost corner of the existing quarry pit. Sand martins and their nests are protected under the WA, and are Amber-listed as per BoCCI (Gilbert, et al., 2021).

Whilst WSP ecologists were aware of reports of nesting peregrine falcons onsite, as noted in Golder (2020), none were observed. Sightings of peregrine falcons were not expected, considering that they utilise the quarry as a breeding site and surveys were carried out outside the breeding season. The Applicant was able to indicate the approximate location on top of a quarry wall, where they frequently return to nest.

Peregrine falcons and their nests are protected under the WA, and are listed in Annex I of the Birds Directive. They are currently green-listed per Gilbert *et al.* (2021).

The locations of sand martin burrows and the known peregrine falcon nesting site are provided in Figure 4-8**.**

Herpetofauna

One live adult specimen of common frog was recorded in a puddle in the north-western area of the Site (see Figure 4-8). The ponds (FL4) noted outside the existing quarry pit were considered suitable for breeding amphibians, including common frog and smooth newt. As mentioned, due to the level of disturbance the waterbodies in the quarry pit are not considered suitable habitat for herpetofauna.

Common lizard was not observed. However, this species utilises a wide range of habitats[25], and may inhabit any area where they are afforded suitable basking conditions (such as bare rock or sand that would reflect heat) and some nearby cover that they can quickly escape to in the presence

[25] https://iwt.ie/species-list/

of predators. Bare rock is in abundance at the Site, but the areas around the upper fringes of the quarry pit are considered particularly suitable, where bare rock interfaces with vegetation.

Aquatic Fauna

The aquatic habitats found onsite have no surface connections to the wider hydrological network. As such, it is unlikely that fish or any other aquatic macrofauna (including otter) are present at the Site.

Invasive Species

No invasive flora species were observed during the 2023 surveys. As described, Sika deer and feral goats were observed. Sika deer are designated as invasive in S.I. 477/2011, and while feral goats are not designated, they have been included as invasive species for this Site, considering the notable herd size that is present, their reputation as voracious grazers.

Figure 4-8 – Fauna Observations

4.4.5 SURVEY LIMITATIONS

Grant of leave to apply for substitute consent occurred on 01 August 2023, after which the Applicant had 12 weeks to submit an application. A series of extensions were granted by ABP, bringing the submission deadline to the end of February 2024. The scheduling of 2023 surveys was therefore constrained by these events. Details are provided in this section.

4.4.5.1 Breeding Birds

Surveys in 2019/2020 did not include breeding birds, due to Covid-19 restrictions. In 2023, breeding bird surveys were also not completed, as the site surveys were completed outside the optimal window – typically breeding bird surveys are completed over multiple visits between March and August.

4.4.5.2 Botany and Habitats

The 2023 surveys (November) took place outside the optimal season for botanical surveys. Many species will have experienced winter dieback and had no above-ground presence. However, the 2019/2020 surveys took place in August, which is within the optimal survey window.

4.4.5.3 Herpetofauna

The 2023 surveys took place outside the optimal seasons for herpetofauna. Typically, one can expect Irish herpetofauna to be hibernating by November. The 2019/2020 surveys occurred when adults would have been visible, although the breeding season was missed.

4.4.5.4 Invertebrates

The 2019/2020 surveys did not include a search for invertebrates. The 2023 surveys took place outside the optimal seasons for terrestrial invertebrates (ca. April-September inclusive).

4.4.5.5 Significance

Breeding Birds

The impact assessment is lacking site-specific data on breeding bird assemblages. However, the substitute consent application is only concerned with activities during the assessment period (refer to Section 4.1.2). Operations during the assessment period have (for the most part) not expanded laterally so as to result in the loss of breeding habitat – this includes scrub, hedgerows and quarry cliff faces. A small area of grassland has been lost, and site-specific data is not available for ground-nesting species. Operations have not intensified during the assessment period so as to have produced environmental emissions of greater magnitude than previously.

For the area of grassland lost, WSP has applied the precautionary principle and assumed the presence of ground-nesting birds at the time of habitat removal.

In this context, the lack of breeding bird survey data is not considered significant.

Botany and Habitats

Considering the 2019/2020 surveys were conducted during the optimal window, and that the assessment period involved minimal lateral expansion of the existing quarry pit, WSP considers that substantial alterations of species or habitat assemblages have not occurred. Furthermore, historical and current aerial imagery is available such that visual comparisons can be made of the overall site. WSP therefore considers that sufficient data is available to complete an impact assessment.

In this context, this is not considered to be a significant limitation.

Herpetofauna

Considering the 2019/2020 surveys were conducted during the optimal window, and that the assessment period involved minimal lateral expansion of the existing quarry pit, WSP considers that substantial alteration of habitat assemblages has not occurred. The silt lagoons within the quarry pit are so disturbed so as to be completely devoid of vegetation, and unsuitable for breeding amphibians.

In this context, this is not considered to be a significant limitation.

Invertebrates

The assessment period involved minimal lateral expansion of the existing quarry pit, and the habitat that was removed (improved agricultural grassland) has very limited floral diversity, thereby offering limited value to terrestrial invertebrates.

In this context, this is not considered to be a significant limitation.

4.5 OVERALL EVALUATION

Based on a review of the existing environment presented in the baseline above, an evaluation of IEFs identified are provided in Table 4-10, following the criteria outlined in Table 4-1. Justification is provided for the omission and inclusion of IEFs. Only designated and notable sites deemed to have connectivity with the Site (see Table 4-4) have been considered.

Only important IEFs deemed of Local Importance (Higher Value) or above have been carried through to the assessment stage.

Reference is made to ‘core areas’, ‘stepping stones’ and ‘corridors’ as defined in Chapter 12 of the Kildare County Development Plan:

Core Areas – these are large geographical areas of influence and importance, for reasons of ecology, landscape, designation, heritage, environmental management and ecosystem services.

Stepping Stones – these are smaller geographical areas but either critically important because of their environmental quality (i.e., local native woodlands, intact bogs/peatlands, wetlands), local amenity value (i.e., urban parks) or because of their scale as undeveloped areas, such as Coillte forestry plantations.

Corridors – these are the connectors providing vital linkages in the networks, for example, canals, stream/river corridors and the associated riparian corridors or valleys, disused railway lines, etc.

Table 4-10 - Evaluation of Ecological Features

Ecological Feature	Summary Description / Justification for inclusion or omission	Evaluation[26]	Important Ecological Feature (IEF)
Designated and Notable Sites			
Red Bog, Kildare SAC (000397) Red Bog, Kildare pNHA (000397)	European designated site and pNHA. There is no groundwater connectivity with the Development. There is potential connectivity for dust emissions, which will be discussed in more detail in the impact assessment.	International Importance	Yes
Poulaphouca Reservoir SPA (004063) Poulaphouca Reservoir pNHA (000731)	European designated site and pNHA. There is no groundwater or (surface) hydrological connectivity. However, there is functional connectivity for greylag geese, by virtue of the presence of suitable foraging habitat on the lands surrounding the quarry pit, including the grassland that has been removed (see Area 'D' in Figure 4-5).	International Importance	Yes
Wicklow Mountains SPA (004040)	European designated site Functional connectivity – it is within the maximum recorded range for foraging peregrine falcons.	International Importance	Yes
Habitats			
Mesotrophic Lakes FL4	Wetlands are 'stepping stones' as per County Development Plan. Suitable breeding habitat for local populations of amphibians.	Local Importance (Higher Value)	Yes
Artificial Lakes and Ponds FL8	Largely devoid of vegetation due to the magnitude of disturbance, and accordingly unsuitable for most fauna.	Local Importance (Lower Value)	No
Improved Agricultural Grassland GA1	This habitat, whilst utilised by wildlife is not considered as ecologically valuable as other habitats present within the Development. This habitat type is not listed in the local BAPs.	Local Importance (Lower Value)	No

[26] IEFs evaluated in line with NRA (2009) 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

Ecological Feature	Summary Description / Justification for inclusion or omission	Evaluation[26]	Important Ecological Feature (IEF)
Dry Meadows and Grassy Verges GS2	This habitat exhibits moderate floral diversity, and generally represents local grassland biodiversity 'hotspots' in a landscape that is otherwise dominated by agricultural pasture or tillage. Not mentioned in local BAPs, and no Annex I affinity.	Local Importance (Higher Value)	Yes
Wet Grassland GS4	As with GS2 above, this habitat exhibits moderate floral diversity, and generally represents local grassland biodiversity 'hotspots' in a landscape that is otherwise dominated by agricultural pasture or tillage. It is not a wetland (Irish Wetlands Committee, 2018) but it is suitable for amphibians, many invertebrates with an aquatic larval phase and some BoCCI. It should be noted that impacts to fauna are discussed separately.	Local Importance (Higher Value)	Yes
Mixed Conifer Woodland WD3	This woodland likely originated as a conifer plantation. Despite not being as intensively managed now, it lacks high floral diversity. It may be utilised by species such as badger, red squirrel, pine marten and BoCCI. Recent research[27] has found that red squirrel is more vulnerable to predation in conifer plantation, due to the lack of vegetative structural complexity. Recognised as a 'stepping stone' in the County Development Plan. Considered important at a local scale.	Local Importance (Higher Value)	Yes
Scrub WS1	In areas largely devoid of woodland, scrub is an important alternative habitat for species that would otherwise utilise woodland. Unlike hedgerows (see below), scrub is not specifically mentioned in local BAPs or the County Development Plan. It lacks the status of a 'wildlife corridor' that is afforded to hedgerows. It is nonetheless an important resource for breeding birds (potentially BoCCI).	Local Importance (Higher Value)	Yes

[27] Twining, J. P., Sutherland, C, Reid, N. and Tosh D. G. (2022). Habitat mediates coevolved but not novel species interactions. Proceedings of the Royal Society B. **289 (1966)**.

Ecological Feature	Summary Description / Justification for inclusion or omission	Evaluation[26]	Important Ecological Feature (IEF)
Hedgerows WL1 and Treelines WL2	In areas largely devoid of woodland, hedgerows and treelines are important alternative habitats for species that would otherwise utilise woodland. 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. Considered important at a local scale.	Local Importance (Higher Value)	Yes
Spoil and Bare Ground ED2	This habitat is directly linked with anthropogenic disturbance, leading to a complete lack of vegetation. There is no reference to this habitat in the local BAPs or the County Development Plan.	Local Importance (Lower Value)	No
Recolonising Bare Ground (ED3)	This habitat is the first stage in ecological succession, after bare ground (see above) begins to experience colonisation by ruderal flora. Within the Development, this habitat is associated with portions of the quarry pit that have been recently disturbed but subsequently left alone for a short period. There is no reference to this habitat in the local BAPs or the County Development Plan.	Local Importance (Lower Value)	No
Active Quarries and Mines (ED4)	This habitat is directly linked with anthropogenic disturbance, and has no associated vegetative coverage. There is no reference to this habitat in the local BAPs or the County Development Plan. Please note that impacts to birds (i.e. sand martins and peregrine falcons) are covered separately.	Local Importance (Lower Value)	No
Buildings and artificial surfaces BL3	Buildings, haul roads and other man-made structures are not considered of high ecological importance within the Development. This habitat type is not included in any local BAPs or the County Development Plan.	Local Importance (Lower value)	No
Protected Species			
Breeding birds	Numerous habitats within the Development are suitable for breeding birds – in particular woodland, hedgerows/treelines and scrub. Ground-nesting species may breed in areas where land management intensity is low. Sand martins (Amber - BoCCI) and peregrine falcon (Annex I – Birds Directive) are known to breed at the Site. Populations	Local Importance (Higher Value)	Yes

Ecological Feature	Summary Description / Justification for inclusion or omission	Evaluation[26]	Important Ecological Feature (IEF)
	using the Site, based on the available evidence, do not meet the threshold for county importance. Specific breeding bird surveys were not undertaken, but it can be assumed with confidence that numerous species use the above-described habitats for breeding, some of which may be BoCCI. 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.		
Overwintering birds	The presence of agricultural pasture within the Development and adjacent to the quarry pit equates to the presence of suitable foraging habitat for certain species of swan and goose. Note that impacts to greylag geese associated with Poulaphouca Reservoir SPA/pNHA are covered above under European Sites. The site is not considered a valuable foraging resource for non-QI species.	Local Importance (Lower Value) .	Yes
Bats	Habitats within the Development provide important foraging, commuting and roosting habitat for bats. All bat species are protected under the WA and are mentioned the County Development Plan.	Local Importance (Higher Value)	Yes
Badger	Badgers are likely present within the Development. Badgers are protected under the WA.	Local Importance (Higher Value)	Yes
Amphibians	Suitable habitat for breeding amphibians has been identified in both examples of FL4, and a live frog specimen was noted in a puddle to the north of the Site, outside the quarry pit. Smooth newt may also be present. Both are likely to be present in areas of periodic inundation. Common frog and smooth newt are protected under the WA.	Local Importance (Higher Value)	Yes
Reptiles	Certain areas of the Development are suitable for common lizard – particularly areas of exposed rock, which provide good opportunities for basking. It was noted in the desk study. Its presence is assumed. Common lizard is protected under the WA.	Local Importance (Higher Value)	Yes
Terrestrial invertebrates	Suitable habitat for invertebrates (in a general sense) was noted during the surveys. No protected or notable species were recorded during the surveys, although it is acknowledged that targeted	Local Importance (Higher Value).	Yes

Ecological Feature	Summary Description / Justification for inclusion or omission	Evaluation[26]	Important Ecological Feature (IEF)
	invertebrate surveys were not carried out. Some notable species were noted in the desk study. Assigned Local Importance (Higher Value) as a precaution.		
Other notable species	Hedgehog, pygmy shrew, red squirrel, pine marten, Irish hare and red deer were noted during the desk study. Red squirrel was recorded during monitoring of a badger sett in 2020. The site contains suitable habitat for these species, all of which are protected under the WA.	Local Importance (Higher Value).	Yes
Rare flora	Neither the desk study nor the field surveys identified any rare flora.	Local Importance (Lower value)	No
Invasive species	Several species were noted in the desk study. During field surveys, grey squirrel and sika deer were observed. These species are listed in Schedule 3 of the Birds and Natural Habitats Regulations. 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 Development during the assessment period, with reference to the ecological evaluation of the Site as shown in Table 4-10. Assessment of impacts is in accordance with the methodology described in Section 4.3.7.

Activities during the assessment period have largely been confined to the existing quarry pit, with the only exception to this being the recent incursion into agricultural grassland (area 'D' in Figure 4-5). Potential impacts have been considered in the context of groundwater, dust and noise emissions, as well as habitat loss and the potential spread of invasive species. Further detail is provided in the following subsections.

Information relating to the above-mentioned emissions has been taken from the relevant chapters in this rEIAR – please refer to Chapter 7 (Water), Chapter 9 (Air Quality) and Chapter 10 (Noise) for more detail. Monitoring locations are illustrated in Figure 4-9.

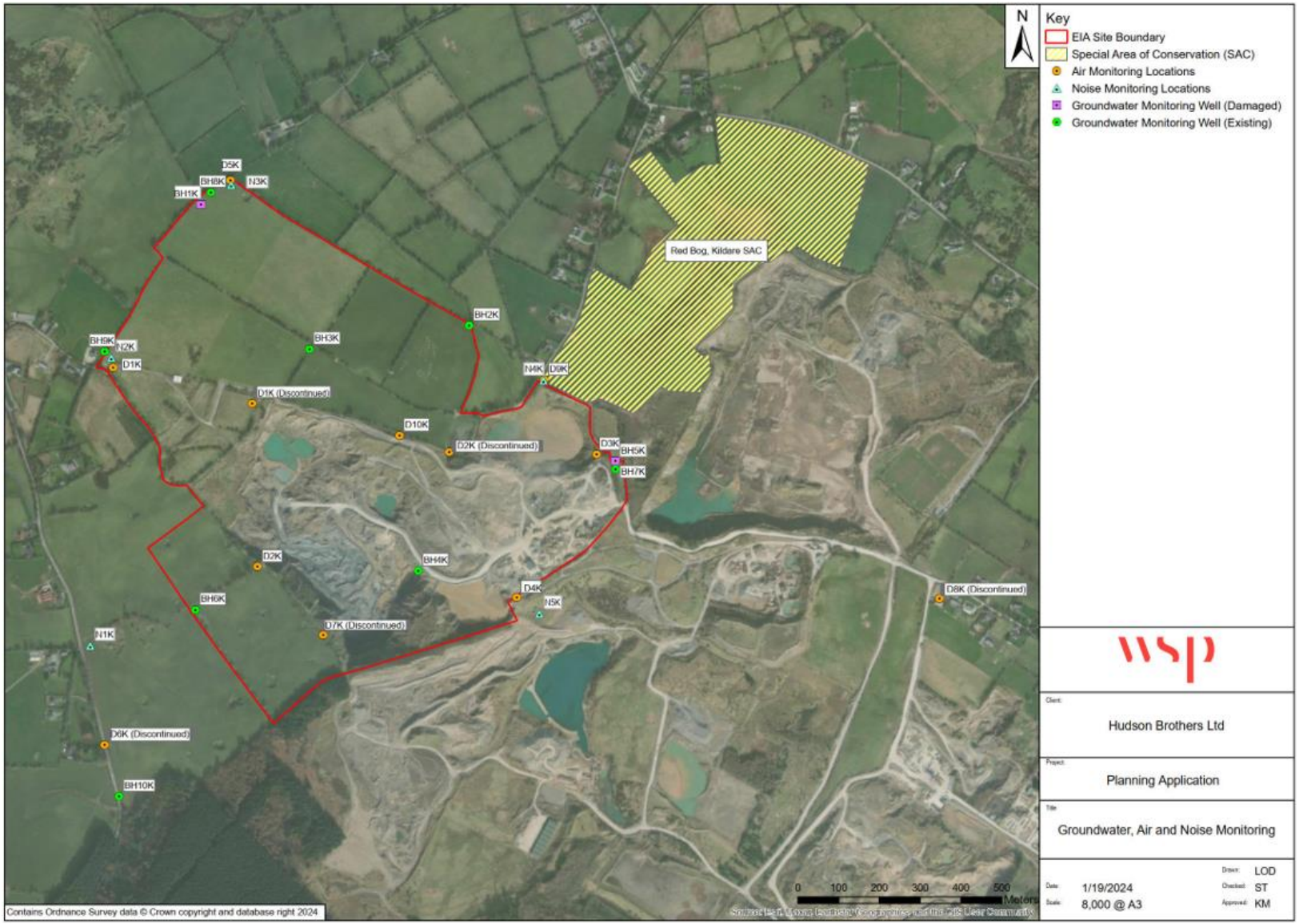

Figure 4-9 - Emissions Monitoring Locations

4.6.1 CONSIDERATION OF ECOLOGICAL IMPACTS - RATIONALE

The factors contributing to potential impacts have been considered. Impacts in relation to surface water, groundwater, dust and noise emissions, habitat loss and the spread of invasive species are considered plausible, considering the nature of the activity onsite and the observable changes to the surrounding environment.

4.6.1.1 Water – Surface and Ground

In accordance with the surface water management arrangements at the Site (see Chapter 7, Water) and the nature of the topography at the Site, surface water does not discharge from the Site.

With respect to groundwater:

- Groundwater gradient is to the west/northwest;
- Works have not interfaced with the groundwater table; and
- Physico-chemical analysis of groundwater within, and down-gradient of the Site indicate that groundwater quality perturbations have not occurred.

A hydrogeological report on Red Bog, Kildare SAC (100 m from Site boundary) carried out for Hudson Brothers Ltd. (Golder Associates, 2008) states the following in relation to the bog's water source:

'Notwithstanding the possibility of intermittent springs and seepages, the source of water for this type of formation (Red Bog) is principally confined to precipitation. The hydraulic catchment for Red Bog is expected to extend little further than its surface expression. Overland flow will occur around the immediate periphery during storm events, but this influence is not expected to extend the catchment radially by more than several metres'

It should also be noted that the most up-to-date groundwater monitoring data from monitoring well BH2K (adjacent to Red Bog, Kildare SAC) indicates that the groundwater table has not encroached any closer than 5.8 m below the top of the well casing. The original water strike depth when the well was drilled was 26m, indicating that the groundwater table is confined at depth. Pressure has caused the water levels to rise up in the well. This is consistent with conclusions drawn in the Environmental Impact Statement (EIS) submitted with the planning application in 2007, and the EIAR submitted in 2020, both of which stated that the surface waterbody associated with Red Bog, Kildare SAC is a perched water feature. Red Bog, Kildare SAC is therefore isolated from the groundwater table.

4.6.1.2 Dust

The effect of airborne particulate matter on plants has been studied on several occasions, and the literature reviewed by Farmer (1993) and Prajapati (2012). Guidance from IAQM (2016) cites Farmer (1993) when making the following statement:

"The level of dust deposition likely to lead to a change in vegetation is very high (over 1 g/m^2/day[28]) and the likelihood of a significant effect is therefore very low except on the sites with the highest dust release close to sensitive habitats."

Prajapati (2012) states that chemical effects of reactive materials (such as cement dust, and particulate sulphates/nitrates[29]) become evident at concentrations of approximately 2 g/m^2, with reference to a study by Grantz *et al*. (2003).

The paper by Farmer (1993) refers to studies by Spatt and Miller (1981) and Walker and Everett (1987), both of which examined effects of dust deposition on more sensitive bryophyte communities[30] alongside a major road in Alaska. It was found that species of *Sphagnum* declined where dust deposition was between 1000-2500 mg/m^2/day. Decline of *Sphagnum* coverage was noted up to 20 m from the road.

Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014) provides a mechanism for determining the sensitivity of an area to ecological impacts. It is reproduced in Table 4-11 below. It essentially considers the sensitivity of an ecological receptor and the distance between it and the source of dust, in determining the likelihood of significant impacts. In the context of the Development, Red Bog SAC is an ecological receptor of 'High' sensitivity. Dust emissions arising from within 20 m would be considered to pose a high risk of significant impacts[31], and those arising from within 50 m would be considered to pose a medium risk of significant impacts. Whilst the table does not provide details for further distances, it can be reasonably inferred that emissions arising further than 50 m from a receptor of 'High' sensitivity would be considered to pose a low risk of significant impacts.

Table 4-11 – Characterising the Sensitivity of an Area to Ecological Impacts (from IAQM, 2014)

Receptor Sensitivity	Distance from the source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Site Dust Emissions

The dust emissions at the nearest monitoring points to Red Bog, Kildare SAC (D3K and D9K) are shown in Figure 4-10. Please refer to Figure 4-9, which provides the locations of dust monitoring

[28] >1000 mg/m^2/day

[29] It should be noted that no cement dust, nor any sulphate/nitrate mineral dust is produced by the Site.

[30] Relevant in the context of Red Bog, Kildare SAC.

[31] This is consistent with the studies cited by Farmer (1993).

stations. The maximum recorded emissions were 698 and 213 mg/m^2/day from D3K and D9K respectively. Mean dust emissions were 190 and 119 mg/m^2/day from D3K and D9K respectively.

Dust emissions from the overall site during the assessment period were not found to be greater than before the assessment period. Please refer to Figure 9-4 in Chapter 9, which shows the average dust emission levels from the site were higher in 2019 than in subsequent years. The evidence therefore indicates that the continuation of site activities during the assessment period has resulted in no increase in dust emissions.

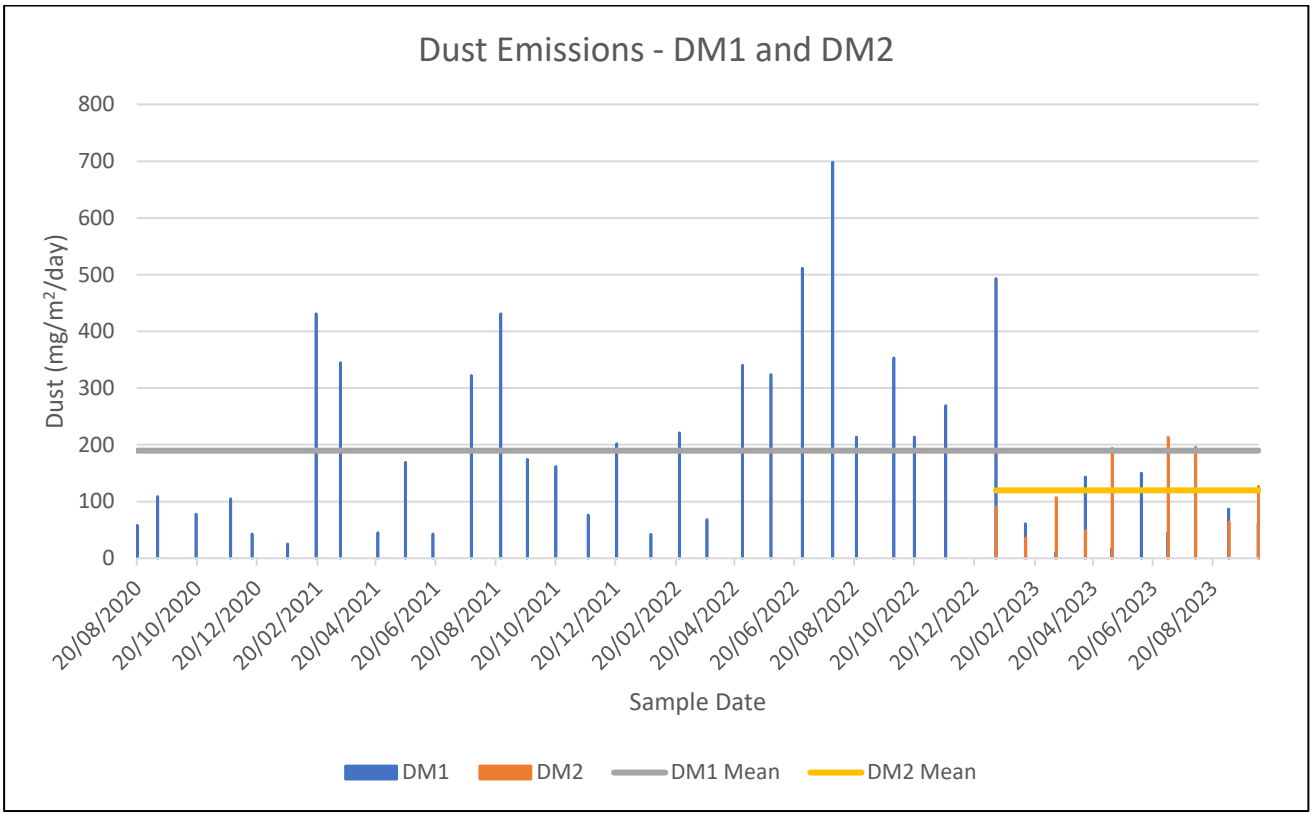

Figure 4-10 - Dust Emissions at D3K and D9K (August 2020-October 2023)

4.6.1.3 Noise

It should be re-emphasised that the assessment period spans between September 2020 and the present day, during which there has been no intensification of operations that would have led to an increase in noise emissions.

Figure 4-11 shows the noise monitoring results between April 2019 and October 2023. It can be observed that noise emissions from the Site have remained stable, and are comparable with emissions prior to the assessment period.

The monitoring point at which the highest noise emissions were observed was N1, located adjacent to the R410, which is the main road between Naas and Blessington (please refer to Figure 4-9). Noise levels at N1 show a downward trajectory since 2019.

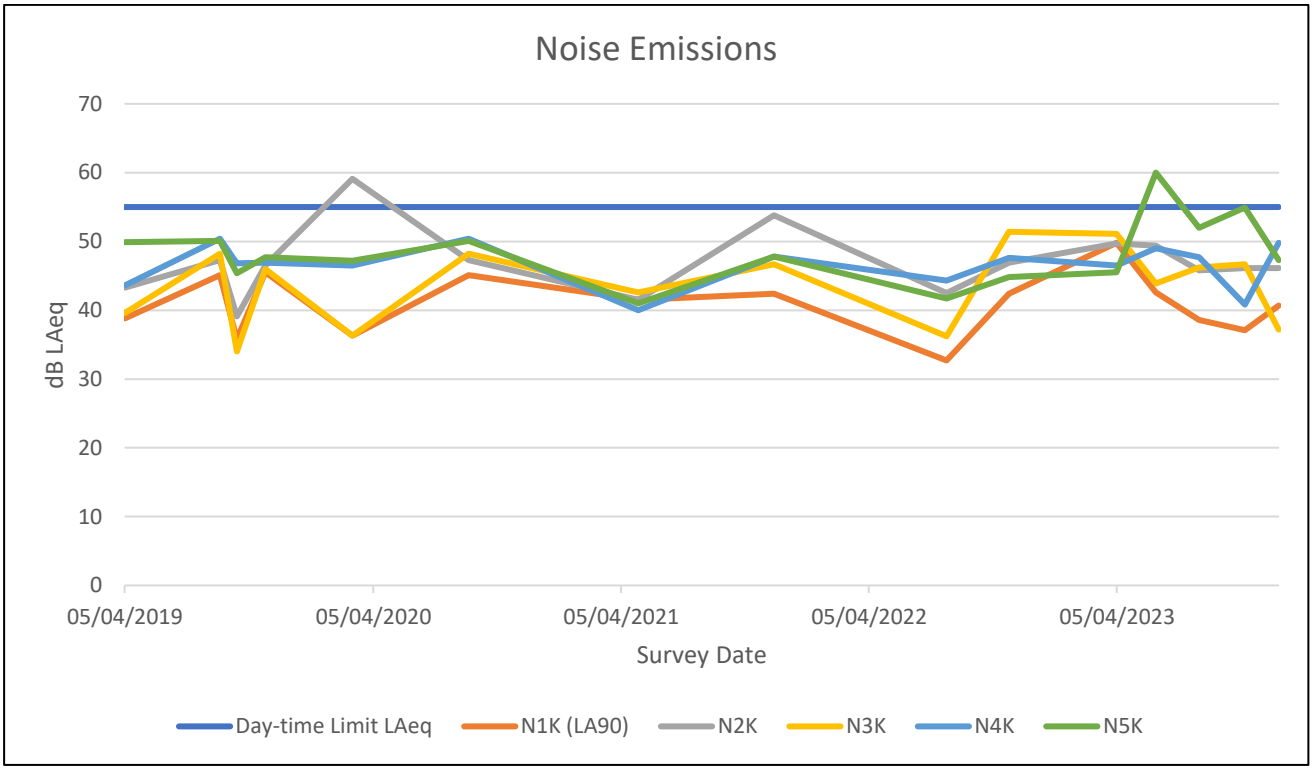

Figure 4-11 - Noise Emissions 2019-2023

According to the noise assessment presented in Chapter 10, due to the proximity of traffic passing the N1 monitoring location, it is more appropriate to consider the LA_{90} noise levels (as opposed to LA_{eq}) when assessing the magnitude of ambient noise at this point (which allows the effects of intermittent nearby traffic to be screened out). Applying this measurement, noise emissions at this location fluctuated between ca. 35-45 dB(A). Survey observations at this location included comments that limited noise from the quarry was audible at times, even during low traffic levels.

The threshold for noise emissions (55 dB), as applied in Chapter 10 (Noise), is based on thresholds set by the Environmental Noise Regulations (S.I. 140/2006) and incorporated into Kildare County Council's Third Noise Action Plan 2019 - 2023[32]. This threshold is based primarily on impacts to humans, and is an indicator of optimal, quiet conditions. Nonetheless, the Waterbird Disturbance Mitigation Toolkit (Cutts, et al., 2013) acknowledges that noise emissions below 55 dB is unlikely to cause a response in waterbirds.

4.6.1.4 Invasive Species

Flora

Considering the nature of the activity at the Site, in particular the ingress of vehicles, plant and machinery and their associated soil disturbance, the transport into the Site of seeds and viable

[32] https://kildarecoco.ie/AllServices/Environment/NoiseNuisance/

tissue of invasive flora is an inherent possibility. However, the below points have also been considered:

- No invasive flora were observed in 2019 or 2023;
- Access to the Site is via the haul road to the south, which does not intersect or run adjacent to Red Bog, Kildare SAC and pNHA;
- The qualifying species of Poulaphouca Reservoir SPA and pNHA are not considered to be sensitive to the potential movement of terrestrial invasive flora. Over a prolonged period, greylag goose terrestrial foraging habitat might be lost to (e.g.) Japanese knotweed scrub, but the assessment period (2020-present) is not long enough for such an effect to have occurred.

Considering the above, the spread of invasive species from the Site is considered highly unlikely to have occurred during the assessment period. Even in the event that this has occurred, there has been no substantial change in the landscape such that there has been a decrease in available foraging habitat for waterfowl (e.g. greylag goose), as a result of the spread of invasive species.

Fauna

Grey squirrel, sika deer and feral goats were observed during site surveys. Sika deer and feral goats are known to contribute to the deterioration of habitat condition through overgrazing, and grey squirrel out-competes native red squirrel for ecosystem resources. However, the habitat assemblage in 2023, when compared to that from 2019/2020 did not exhibit signs of substantial alteration that could be attributed to invasive fauna. Sika deer and feral goats were observed during both surveys, so their presence does not represent the introduction of invasive fauna during the assessment period.

4.6.1.5 Habitat Loss

The only habitat loss identified during the assessment period is the area of GA1 (area ‘D’ as shown in Figure 4-5), which has recently been removed as the Applicant has commenced excavation in this area. Approximately 1.12 ha of GA1 has been lost. GA1 has not been identified as an IEF (Table 4-10). Considering the abundance of this habitat in the surrounding environment, its value as a resource (for foraging waterfowl or ground-nesting birds for example) is considered low.

Ground-nesting Birds

Whilst the loss of a small amount of suitable breeding habitat may not be considered significant in this context, the assessment needs to consider the potential for excavation to have occurred during the breeding season, and to have resulted in the disturbance or destruction of active nests. The surveys that informed the Golder EIAR (2020) were carried out in August (end of breeding season) and September (outside breeding season). Whilst no ground-nesting species were observed during the surveys, the desk study yielded several species records (meadow pipit, skylark, snipe and pheasant).

Aerial imagery (see Figure 4-7) indicates that excavation occurred between January and October 2023. The statutory breeding season is March-August inclusive, but many birds commence nest building before then. WSP therefore considers that it is necessary to apply the precautionary principle in the absence of robust survey data, and assume the presence of nesting birds at the time of habitat removal.

4.6.2 IMPACT ASSESSMENT

Table 4-12 lists potential impacts on European designated sites and pNHAs identified within the EZoI of the Development. There are no NHAs within the EZoI.

Table 4-13 lists potential impacts (in the absence of mitigation) on other habitats and protected species identified within the EZoI of the Development.

Table 4-12 – Potential Impacts on Designated or Notable Conservation Sites

Designated Site	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Red Bog, Kildare SAC (000397) Red Bog, Kildare pNHA (000397)	International Importance	Groundwater contamination, leading to deterioration in habitat condition; Changes to groundwater regime (i.e. fluctuations in level).	As per Section 4.6.1.1: ▪ Groundwater gradient is to the west/northwest (and therefore away from the SAC/pNHA); ▪ Works have not interfaced with the groundwater table; ▪ Physico-chemical analysis of groundwater within, and down-gradient of the Site indicate that groundwater quality perturbations have not occurred; and ▪ The SAC/pNHA is a perched water feature and therefore does not interface with the groundwater table. There is no groundwater connectivity between the Development and the SAC/pNHA. It has therefore been concluded that significant impacts to qualifying habitat (transition mires) did not occur as a result of site activities that may have effected the groundwater regime over the assessment period.	No Impact.
		Dust emissions, leading to deterioration in habitat condition.	With reference to guidance from IAQM (2014, 2016) and literature reviews by Farmer (1993) and Prajapati (2012) (refer to Section 4.6.1.2), the dust emission levels at this area of the Site have not been of a magnitude so as to give rise to significant effects on the qualifying habitat of the SAC/pNHA (transition mires) over the assessment period.	No Impact.
		Spread of invasive species, leading to a deterioration of habitat condition, and a decrease in area coverage of qualifying habitat.	As per Section 4.6.1.4, the spread of invasive species from the Site during the assessment period is considered highly unlikely to have occurred.	No Impact.
Poulaphouca Reservoir SPA (004063)	International Importance	Noise emissions, leading to disturbance of foraging greylag geese in adjacent agricultural grassland.	Since 2020, there has been no substantial change in circumstance – the area footprint of the quarry has remained the same (aside from a minor incursion into some agricultural grassland to the west) and the intensity of activity within the quarry has not increased. Noise monitoring has confirmed that noise emissions have not increased.	No Impact.

Designated Site	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Poulaphouca Reservoir pNHA (000731)			It has therefore been concluded that significant effects to foraging greylag geese did not occur over the assessment period, as a result of noise emissions.	
		Spread of invasive species, leading to a decrease in available foraging habitat for greylag goose.	As per Section 4.6.1.4, the spread of invasive species from the Site during the assessment period is considered highly unlikely to have occurred. Even in such an event, a substantial period of time would need to have elapsed before significant effects can be deemed to have occurred in this context.	No Impact.
		Habitat loss from recent excavations – loss of agricultural grassland.	The loss of approximately 1.12 ha of improved agricultural grassland represents a loss of suitable foraging habitat for greylag goose, which is one of the Special Conservation Interests of the SPA (i.e. one of the species for which the SPA was designated). However, in the context of the surrounding environment as a whole, in particular the abundance of this habitat in all directions, the footprint of area in question is very small. With this in mind, the likelihood of this specific area of the Site being frequented by foraging greylag geese is considered to be very low. Furthermore, the abundance of this habitat as mentioned, means that the removal of this quantity of habitat does not represent a substantial loss. As such, the loss of this quantity of habitat is not considered to have resulted in a significant impact to foraging greylag geese during the assessment period.	Permanent, negative impact. **Not significant.**
Wicklow Mountains SPA (004040)	International Importance	Foraging habitat loss from recent excavations – loss of agricultural grassland.	Approximately 1.12 ha of agricultural grassland was removed in 2023. Considering the abundance of this habitat in the context of the surrounding environment, and considering also the distance of the Site from the SPA (beyond peregrine falcon's core foraging range), the loss of this quantity of agricultural grassland is not considered to represent a significant loss of foraging resource for SPA populations of peregrine falcon.	No Impact.

Table 4-13 – Potential Impacts on Habitats and Species deemed IEFs

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Habitats – Outside Designated or Notable Sites				
Mesotrophic Lakes FL4	Local Importance (Higher Value)	Habitat loss; Deterioration of condition, through pollution.	Activity during the assessment period has not resulted in the loss of this habitat. The nature or intensity of the activity at the Site has not changed during the assessment period, such that baseline conditions of the surrounding environment have remained the same. As such, the Development is not considered to have contributed to deterioration of this habitat.	No Impact
Dry Meadows and Grassy Verges GS2	Local Importance (Higher Value)	Habitat loss	Activity during the assessment period has not resulted in the loss of this habitat.	No Impact
Wet Grassland GS4	Local Importance (Higher Value)	Habitat loss	Activity during the assessment period has not resulted in the loss of this habitat.	No Impact
Mixed Conifer Woodland WD3	Local Importance (Higher Value)	Habitat loss	Activity during the assessment period has not resulted in the loss of this habitat.	No Impact
Scrub WS1	Local Importance (Higher Value)	Habitat loss	Activity during the assessment period has not resulted in the loss of this habitat.	No Impact
Hedgerows WL1 and Treelines WL2	Local Importance (Higher Value)	Habitat loss	Activity during the assessment period has not resulted in the loss of this habitat.	No Impact
Species				
Breeding birds	Local Importance (Higher Value)	Disturbance during breeding season Destruction of nests and/or direct kills.	Noise and dust emissions during the assessment period are comparable to previous levels, indicating no change in circumstance in this regard. The incursion into improved agricultural grassland is considered likely to have occurred during the breeding season. Without survey	**Permanent, negative impact, significant at a local scale.**

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
			data, the precautionary principle is applied and nesting birds are assumed to have been present. In this scenario the following effects are considered likely to have occurred: Disturbance of active nests; Destruction of active nests; and Direct mortality of individuals. Depending on their age, chicks may have been able to leave a nest and escape into surrounding habitat. This depends on the species in question and the time when activity occurred. All of the above possibilities would have resulted in reduced breeding success, and therefore a reduction in local populations.	
		Loss of breeding habitat	The loss of approximately 1.12 ha of improved agricultural grassland represents a net loss in potential breeding habitat for ground-nesting birds. The surveys did not record the presence of ground-nesting birds, but several species were present in the desk study results. The abundance of this habitat in the wider environment diminishes the significance of this impact.	Permanent, negative impact. **Not significant**.
Overwintering birds (large waterfowl)	Local Importance (Higher Value)	Disturbance and deterrence from foraging.	Since 2020, there has been no substantial change in circumstance – the area footprint of the quarry has remained the same (aside from a minor incursion into some agricultural grassland to the west) and the intensity of activity within the quarry has not increased. Noise monitoring has confirmed that noise emissions have not increased. It has therefore been concluded that significant effects to foraging overwintering birds did not occur over the assessment period, as a result of noise emissions.	No impact
		Loss of foraging habitat	The loss of 1.12 ha of improved agricultural grassland represents a loss of suitable foraging habitat for some species of goose and swan. However, in the context of the surrounding environment as a whole, in particular the abundance of this habitat in all directions, the footprint of area in question is very small. With this in mind, the likelihood of this specific area of the Site being frequented by foraging waterfowl is considered to be very low. Furthermore, the	Permanent, negative impact. **Not significant.**

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
			abundance of this habitat as mentioned, means that the removal of this quantity of habitat does not represent a substantial loss. As such, the loss of this quantity of habitat is not considered to have resulted in a significant impact to foraging waterfowl during the assessment period.	
Bats	Local Importance (Higher Value)	Disturbance and deterrence from foraging.	Since 2020, there has been no substantial change in circumstance – the area footprint of the quarry has remained the same (aside from a minor incursion into some agricultural grassland to the west) and the intensity of activity within the quarry has not increased. Noise monitoring has confirmed that noise emissions have not increased. Light emissions have not increased, and no loss of roosting, foraging or commuting habitat (by way of tree or hedgerow removal) has occurred. It has therefore been concluded that significant effects to bats did not occur.	No impact
Badger	Local Importance (Higher Value)	Disturbance and/or destruction of setts.	No badger setts were found within the existing quarry pit, and nor were any found in the area of grassland that was subsequently removed. The nearest badger sett to this area of grassland was ca. 280 m away. Aside from the incursion into the area of grassland as mentioned, the quarry footprint has not expanded laterally. As mentioned already, there has been no increase in noise or dust emissions representative of a change in circumstance from prior conditions.	No impact
Amphibians	Local Importance (Higher Value)	Loss of breeding habitat.	Due to the level of activity within the quarry pit, the lagoons have been deemed unsuitable for amphibians, as well as all other flora and fauna. There has been no loss of suitable breeding habitat during the assessment period.	No impact.
Reptiles	Local Importance (Higher Value)	Loss of suitable habitat.	Aside from the incursion into the area of grassland as mentioned, the quarry footprint has not expanded laterally. It is therefore considered that substantial loss of suitable habitat has not occurred.	No Impact.

Ecological Feature	Evaluation	Potential Impacts	Impact Assessment	Conclusion
Terrestrial invertebrates	Local Importance (Higher Value)	Loss of suitable habitat.	Aside from the incursion into the area of grassland as mentioned, the quarry footprint has not expanded laterally. Improved agricultural grassland is a species-poor habitat and therefore of limited value as a resource for invertebrates. It is therefore considered that substantial loss of suitable habitat has not occurred.	No Impact.
Other protected mammals	Local Importance (Higher Value)	Loss of suitable habitat, Disturbance and/or destruction of burrows or other breeding/resting places. Direct kills of individuals.	Aside from the incursion into the area of grassland as mentioned, the quarry footprint has not expanded laterally. Surveys did not record any evidence of mammal activity in the area of grassland that was removed. It is therefore considered that substantial loss of suitable habitat has not occurred, and nor did any disturbance or destruction of mammal breeding/resting places or direct kills of individuals.	No Impact.
Invasive species	Local Importance (Higher Value)	Deterioration of habitat condition Spread of invasive species	The assemblage and appearance of habitats was found to broadly correspond with previous surveys, aside from the removal of grassland by the Applicant as mentioned. The presence of sika deer, grey squirrel and feral goat was noted prior to the assessment period – their presence in 2023 therefore does not represent their introduction to the Site. Invasive flora were not recorded in any of the surveys. Haul routes from the Site are such that connectivity to designated/notable sites is highly unlikely. It is therefore considered that significant ecological impacts during the assessment period have not occurred.	No Impact.

4.7 REMEDIAL MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES REQUIRED

The objective of this section is to explore potential mitigation options in a retrospective context, to any significant impacts deemed to have occurred during the assessment period. In accordance with the impact assessment presented in Table 4-13, only one impact was deemed to have been significant at a local scale – on ground-nesting birds that may have been nesting at the time of excavation (based on conservative assessment). In this scenario, it is possible that nests were destroyed and/or live birds were harmed or killed.

With reference to the mitigation hierarchy (see Table 4-3), and acknowledging that these events have already occurred, it is impossible to avoid or mitigate impacts. The only recourse is therefore to compensate and enhance.

4.7.1 SECTION 37L APPLICATION

Subject to the success of this substitute consent application, the Applicant also intends to apply for permission to continue future quarrying operations at the Site, and to expand the area footprint of the existing pit. This application will be submitted separately, under Section 37L of the Planning and Development Act, as amended. That being the intention, any proposals for biodiversity enhancement need to be incorporated into future plans for the Site, and therefore included in the Section 37L application.

4.7.2 COMPENSATION AND ENHANCEMENT – GROUND-NESTING BIRDS

The following compensation and enhancement is included in the Concept Restoration Plan (Chapter 11 – Landscape and Visual). A more detailed Restoration Plan will be included with the Section 37L Application, which will incorporate all mitigation, compensation and enhancement measures for past and future impacts.

Whilst any losses of individual birds cannot be compensated, the loss of approximately 1.12 ha of suitable ground-nesting habitat should be replaced on a like-for-like basis as a minimum (i.e. at least 1.12 ha of suitable habitat should be created). WSP suggests that a more diverse, unimproved grassland should be created, as the previous area was occupied by improved agricultural grassland, which is typically a species-poor habitat and of low ecological value. A range of native graminoids (grasses, sedges and rushes) and other herbaceous species should be sown, which will increase floral diversity as well as providing a range of cover for ground-nesting species.

4.8 RESIDUAL EFFECTS

Following the implementation of compensation and enhancement as discussed above, the residual impacts on IEFs are listed in Table 4-4.

Table 4-14 – Residual Impacts

Important Ecological Feature	Potential Effects Identified	Potential Impact and scale	Compensation and Enhancement	Residual Impacts
Breeding birds (ground-nesting)	Disturbance and direct mortality, leading to a reduction in local populations.	Permanent, negative impact, significant at a local scale.	Reinstatement of suitable habitat and enhancement of floral diversity. Suitable nesting habitat afforded to the affected species will provide opportunity for populations to re-attain pre-works levels. As such, the temporal nature of the impact is reduced from permanent to temporary.	Temporary negative impact, significant at a local scale.

4.9 CUMULATIVE EFFECTS

As well as considering the potential significant impacts from the Site in isolation, the assessment must also consider those effects in combination with those associated with other plans or projects. Whilst a project in isolation may not result in significant impacts, non-significant impacts from one project could act in combination with non-significant impacts of another project, resulting in significant impacts overall.

In this context, an important distinction to make is whether a project in isolation may result in effects that are not significant, or whether they will not result in any effects at all.

Groundwater

Considering the lack of groundwater connectivity between the Site and Red Bog SAC/pNHA as described, it is considered that there is no potential for any impacts to have occurred during the assessment period. Groundwater cumulative effects are therefore screened out from further assessment.

Noise and Dust

Given that there is connectivity for noise (Poulaphouca Reservoir SPA/pNHA) and dust emissions (Red Bog SAC/pNHA), the potential for these to act in combination with other projects must be considered. The scope of this in-combination assessment has therefore considered other plans and projects with a radius of 500 m of the Site. A distance of 500 m was chosen based on the distance of noise monitoring station N1 from the edge of the existing quarry pit. N1 is the furthest monitoring station from the existing quarry pit, and noise impacts from the quarry at this location have been deemed to be insignificant (see Section 4.6.1.3). As such, 500 m has been chosen as a representative distance beyond which noise impacts did not occur. In addition, in accordance with Table 4-11, dust impacts are considered up to a distance of 50 m from the boundary of Red Bog, Kildare SAC.

Habitat Loss

The loss of grassland as a resource for foraging birds was found to be insignificant in isolation, but it may contribute to large-scale habitat loss in the wider environment. However, given that the loss of this grassland (in isolation) has been considered significant in light of impacts to ground-nesting birds, and that re-instatement of this habitat is already proposed, cumulative assessment of this impact has been scoped out.

The cumulative assessment considered planning applications for which permission was granted between September 2015 and November 2023[33]. Refused applications and applications for retention were not included for consideration. Retention applications refer to unauthorised works that were already complete and therefore did not interact with the operations at the Site. Similarly, applications for which a decision has yet to be made have also been excluded. Please see Table 4-15. Sources for the search of planning applications included:

- Planning Enquiry System – Kildare County Council (https://webgeo.kildarecoco.ie/planningenquiry - Accessed 04 December 2023);
- Planning Enquiry System – Wicklow County Council (https://www.eplanning.ie/WicklowCC - Accessed 04 December 2023); and
- EIA Portal (https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal - Accessed 04 December 2023).

Kildare County Development Plan 2023-2029[34] and Wicklow County Development Plan 2022-2028[35] were also consulted.

Table 4-15 - Planning Applications

Planning Reference	Year Consented/Status	Location	Description of the proposal, and conclusion in respect of significant impacts in combination with the Development
17541 (Kildare)	Granted 16/04/2018	Redbog, Rathmore, Naas, Co. Kildare. North side of L6038-1. Property entrance is ca. 50m from the boundary of Red	Construction of a dormer bungalow, domestic garage, septic tank and percolation area and all ancillary works and services. Historic imagery (Google Earth) indicates that this building was completed by March 2020. The activity associated with this project did not occur during the assessment period. The house is located at the rear (north) of the property and screened from the SAC by tall trees. Considering this, as well as the scale of the

[33] The focus of this retrospective in-combination assessment is on development that occurred at within the assessment period. Five years is the standard duration of planning permission, from the date that permission is granted (OPR, 2022). The date range includes projects that may have been granted permission in late 2015, but may not have commenced works until late 2020 (thereby within the assessment period).

[34] https://kildarecoco.ie/AllServices/Planning/DevelopmentPlans/KildareCountyDevelopmentPlan2023-2029/ - Accessed 04 December 2023

[35] https://www.wicklow.ie/Living/CDP2021 - Accessed 04 December 2023

Planning Reference	Year Consented/Status	Location	Description of the proposal, and conclusion in respect of significant impacts in combination with the Development
		Bog, Kildare SAC.	works concerned, it is highly unlikely to have contributed adverse levels of dust emissions so as to result in negative effects to Red Bog, Kildare SAC. There is no scope for this project to have interacted with the Site activities occurring during the assessment period. **No Significant Impacts**
15880 (Kildare)	Granted 22/07/2016	Hillgate, Redbog, Rathmore, Naas, Co. Kildare. North side of L6038-1. Property entrance is ca. 6 m from the boundary of Red Bog, Kildare SAC.	Removal of existing roof on north side of dwelling, and placing instead a dormer type roof this side to match height of existing dormer roof on dwelling south side, for insertion of 3 new Velux and 2 dormer windows in front/east section of new roof, and 3 new dormer windows and 1 Velux window in rear/west section of new roof, for insertion of 5 new Velux windows in existing roof to south side of dwelling, for changing of existing slate roof covering to a flat concrete tile covering to entire roof, for a new single storey rear extension to dwelling and a new external sliding door on south side ground floor, and for a new single storey detached garage to north side of dwelling and all associated works. Historic imagery (Google Earth) indicates that this building was completed between June 2020 and June 2022. The activity associated with this project therefore occurred during the assessment period. Whilst the property boundary is ca. 6 m from the SAC boundary, the works area is ca. 250m from the qualifying habitat (transition mire). The house is located at the rear (north) of the property and screened from the SAC by tall trees. Considering this, as well as the scale of the works concerned, it is highly unlikely to have contributed adverse levels of dust emissions so as to result in negative effects to Red Bog, Kildare SAC. Kildare County Council made comments on waste management, wastewater treatment and the appropriate storage of heating oil, but did not query the potential for adverse dust emissions. Considering all of the above circumstances, it is therefore considered that there is no credible possibility for this project to have interacted with the Site activities occurring during the assessment period. **No Significant Impacts**

Planning Reference	Year Consented/Status	Location	Description of the proposal, and conclusion in respect of significant impacts in combination with the Development
23503 (Kildare)	Granted 12/09/2023	Red Bog, Blessington, Co. Kildare. North side of L6038-1. Property entrance is ca. 50m from the boundary of Red Bog, Kildare SAC.	The construction of a detached domestic shed (ca. 60 m^2) and all associated site works. Given the recent grant of planning permission, it is not clear whether works have commenced. For the purpose of this assessment, it is assumed that they have. The proposed works area is at the rear (north) of an existing dwelling, and is screened by hedging on all other sides. Whilst the property boundary is ca. 50m from the SAC boundary, the proposed works area is ca. 290m from the qualifying habitat (transition mire). Kildare County Council did not raise any objections on the grounds of potential adverse dust emissions. Considering all of the above circumstances, it is therefore considered that there is no credible possibility for this project to have interacted with the Site activities occurring during the assessment period. **No Significant Impacts**
18545 (Wicklow)	Granted 10/07/2018	Deerpark and Dillonsdown townlands, Blessington, Co.Wicklow. Roadstone Limited quarry, adjacent to the south of the Site.	Extension of planning duration by 5 years. Original planning permission (07441) was granted in 2009 in relation to the below activities: Continuation of extraction of sand & gravel on lands that have been used for this purpose since before 1st October 1964, extending to 16.12 hectares & to a final level not lower than 204 m OD (Malin Head); and extraction of sand & gravel on lands extending to 13.36 hectares to a final level not lower than 240m OD (Malin Head), on a site registered under Section 261 of the Planning & Development Act 2000 all on a 29.48 hectare site for a ten year period. Historical aerial imagery (Google) indicates that there has been no notable change in circumstance (no increase in quarry footprint) during the assessment period. As such, baseline dust and noise emission levels are deemed not to have increased so as to contribute to adverse effects on Red Bog, Kildare SAC or Poulaphouca Reservoir SPA. **No Significant Impacts**

4.9.1 CONCLUSION – CUMULATIVE EFFECTS

Considering the information contained in this section, the Site is not considered to have acted in combination with other plans or projects so as to have resulted in significant impacts to any of the IEFs identified.

4.10 SUMMARY AND CONCLUSIONS

The Development has been assessed for its potential to result in significant impacts to important ecological features (IEFs) over the course of the assessment period (September 2020-present). The impact assessment has examined survey data gathered before the assessment period, and compared it with survey data gathered recently (November 2023). It has also used aerial imagery and environmental emissions monitoring data to inform conclusions as to the types of impacts likely to have occurred.

It was found that quarry operations (for the most part) remained confined to the pre-existing quarry footprint, and did not increase in intensity so as to give rise to increased environmental emissions. Dust and noise monitoring data supports this finding. Groundwater monitoring has indicated that there is no groundwater connectivity with the nearby Red Bog, Kildare SAC and pNHA. There are no surface water emissions from the Site.

Aerial imagery has shown that approximately 1.12 ha of agricultural grassland was excavated in 2023, and it cannot be ruled out that this occurred during the bird nesting season; nor can it be ruled out that ground-nesting birds were nesting at the time of excavation. Such an event would have resulted in a permanent, negative impact on local populations of ground-nesting birds.

Compensation and enhancement have been proposed in the form of reinstatement of grassland habitat, which is to be bolstered with a range of native graminoids and other herbaceous species. The provision of suitable nesting habitat will encourage local populations to breed in this location, such that any losses to populations incurred during the assessment period will be restored.

No other impacts were identified, from the Development alone, nor cumulatively with other plans or projects.

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