

Some of which have been summarised below, however, please refer to Chapter 7, section 7.5 herein this EJAR for more details.

5.7.1.1 Construction Phase

The mitigation measures outlined within the Construction Environmental Management Plan (PCEMP) will prevent any adverse impact upon human health arising from spillages and contaminated groundwater as a result of construction activities.

As part of the attached PCEMP, mitigation measures will be implemented during the construction stage that will control soil excavation, manage fuel and chemical handling in a safe way and control water during the construction phase.

Site preparation, excavations and levelling works will be required on site to facilitate the foundations of access roads and the installation of services. There is no evidence of historical contamination in the proposed development area, all excavated material will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of the soil will be analysed for the presence of possible contaminants. Moreover, the effects of stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction.

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off site) which will be away from surface water gulley's in a mobile or double skinned tanks. Moreover, there will be an adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. In addition, where feasible all ready-mixed concrete will be brought to the site by trucks and a suitable risk assessment for wet concreting will be completed prior to works being carried out. In this case of drummed fuel or other chemicals which may be used during construction, containers will be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of spillage.

All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures on site including a combination of silt fencing, settlement measures and hydrocarbon interceptors. All water runoff from designated refuelling areas will be channelled to an oil interceptor or an alternative treatment system prior to discharge. It is proposed that any minor ingress of groundwater and collected rainfall in the excavation will be pumped and discharged via the existing stormwater sewer network. For more information please refer to the technical chapters and accompanying PCEMP.

5.7.1.2 Operational Phase

The kerbed unloading area has been designed to contain leaks from the tanker truck and unloading station during tank fill operations and unloading station maintenance activities. This area will be monitored visually. Moreover, rainwater collecting in the kerbed area will also be visually monitored. The unloading station will include local tank level indication and alarms with automatic shutdown of the unloading station pumps on high level to avoid overfilling the tanks.

The oil storage system tanks will be installed on a concrete foundation and will include a secondary nominal 27.4m diameter wall for leak containment. The tanks will be accessible via a spiral stairway to facilitate visual inspection and maintenance. A hard stand cover and permeable paving across the site prior to discharge into the attenuation system has been included in the design and therefore the risk of accidental discharge has been adequately addressed through design. For more information on this please refer to Section 7.5.2 of this EJAR.

Lastly, petrol interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site. This together

with the proposed hardstand cover and permeable paving will minimise the potential for any impact to the hydrological environment. For further details on this please refer to Chapter 7.

5.7.2 WATER & HYDROLOGY

Due to the inter-relationship between soils, geology, hydrogeology and hydrology, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered in interaction in some sections contained within Chapter 8 (Section 8.5) of this EIAR.

5.7.2.1 Construction Phase

During the construction phase, particular mitigation measures to manage the surface water run-off, fuel and chemical handling and soil removal and compaction on site. Please refer to the appropriate technical chapters for more information mitigation measures to be implemented on this project.

As there is potential for run-off to enter stormwater systems and indirectly discharge to a watercourse, mitigations will be put in place to manage run-off during the construction phase. As discussed above within Section 5.6.1, should any discharge be required during the construction phase, discharge will be to the local drainage ditches. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, attenuation, settlement measures and hydrocarbon interceptors. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavations are kept relatively dry. It is not intended that an underlying aquifer will be required due to the very low permeability of the Dublin Boulder Clay and the relative shallow nature for excavations. Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. These measures will include a combination of silt fencing and settlement measures i.e. silt traps, silt sacks and settlement tanks/ponds.

The temporary storage of soil will be carefully managed and stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection. The movement of material will be minimised to reduce the degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. Furthermore, soil from works will be stored away from existing drainage features to remove any potential impact.

Operational P To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off site) which will be away from surface water gully's in a mobile or double skinned tanks. Moreover, there will be an adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. In addition, where feasible all ready-mixed concrete will be brought to the site by trucks and a suitable risk assessment for wet concreting will be completed prior to works being carried out. In this case of drummed fuel or other chemicals which may be used during construction, containers will be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of spillage.

All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures on site including a combination of silt fencing, settlement measures and hydrocarbon interceptors. All water runoff from designated refuelling areas will be channelled to an oil interceptor or an alternative treatment system prior to discharge. It is proposed that any minor ingress of groundwater and collected rainfall in the excavation will be pumped and discharged via the existing stormwater sewer network. For more information please refer to the technical chapters and accompanying PCEMP.

5.7.2.2 Operational Phase

The kerbed unloading area has been designed to contain leaks from the tanker truck and unloading station during tank fill operations and unloading station maintenance activities. This area will be

monitored visually. Moreover, rainwater collecting in the kerbed area will also be visually monitored. The unloading station will include local tank level indication and alarms with automatic shutdown of the unloading station pumps on high level to avoid overfilling the tanks.

The oil storage system tanks will be installed on a concrete foundation and will include a secondary nominal 27.4m diameter wall for leak containment. The tanks will be accessible via a spiral stairway to facilitate visual inspection and maintenance. A hard stand cover and permeable paving across the site prior to discharge into the attenuation system has been included in the design and therefore the risk of accidental discharge has been adequately addressed through design. For more information on this please refer to Section 7.5 of this EiAR.

Petrol interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site. This together with the proposed hardstand cover and permeable paving will minimise the potential for any impact to the hydrological environment. For further details on this please refer to Chapter 8.

An Environmental safety and health management system (EMS) will be implemented at the proposed development during operations. Moreover, there will be comprehensive emergency response procedures and standard operating procedures to respond to an onsite fuel spillage. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures. For further information on the mitigation measures to be implemented during the operational stage please refer to Section 8.5 of this EiAR.

5.7.3 AIR QUALITY & CLIMATE

5.7.3.1 Construction Phase

In summary the measures which will be implemented include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;
- Any road that has the potential to give rise to fugitive dust shall be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20kph, and on hard surfaced roads as site management dictates;
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

5.7.3.2 Operational Phase

The stack height of the gas fired power generation facility has been designed to ensure that an adequate height has been selected to aid dispersion of the emissions and achieve compliance with the EU ambient air quality standards beyond the site boundary (including background concentrations). No additional mitigation measures are proposed for the operational phase of the Proposed Development.

5.7.4 NOISE & VIBRATION

5.7.4.1 Construction Phase

The following mitigation measures will be applied during the construction of the proposed development:

- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the contractor/developer, Local Authority and residents;
- Appointing a site representative responsible for matters relating to noise and vibration;
- Monitoring levels of noise and/or vibration during critical periods and at sensitive locations; and
- All site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise control measures will be employed, including:

- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors; and
- Situate any noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

Vibration from construction activities to off-site residences be limited to the values set out in Table 10.7. It should be noted that these limits are not absolute, but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes will proceed with caution. Where there is existing damage, these limits may need to be reduced by up to 50%.

5.7.4.2 Operational Phase

The sound power levels of the proposed plant items are detailed in Appendix 10.2. Noise from external plant will be minimised by purchasing low noise generating equipment and incorporating appropriately specified in line attenuators for stacks and exhausts where necessary. With due consideration as part of the detailed design process, this approach will result in the site operating well within the constraints of the best practice guidance noise limits that have been adopted as part of this detailed assessment.

The 12m high barrier also presented in Appendix 10.2 was designed in conjunction with the project engineering team to reduce noise levels at NSLs.

5.8 DO NOTHING SCENARIO

If the Proposed Development were not to proceed, no construction would take place on the site, and there would be no potential for the positive impacts of increased energy supply. If the Proposed Development were not to proceed it is likely that the lands would be developed in time for another development in line with the 'HT' – High Technology Land Use Zoning Objective of the subject site. The Zoning Objective, Vision and Permissible Uses under the HT Zoning Objective are set out below in Table 5.7.

The **Objective** of the Land Use Zoning Heavy Industry – HI is to '*provide for heavy industry*' The **Vision** for this Land Use Zoning states: '*Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. Hi areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses.*

Industry – High Impact, Utility Installations, Fuel Depot/ Fuel Storage, Plant Storage are all classes of use that are permissible as denoted in the Fingal Development Plan 2017 – 2023, Chapter 11, 'Land Use Zoning Objectives'.

Table 5.7 Zoning Objective and Permissible Uses

| Zoning Objective 'HI' – Heavy Industry |
|---|
| Permissible Uses |
| <i>Abattoir; Concrete/Asphalt; Extractive Industry/ Quarrying; Fuel Depot/ Fuel Storage; Heavy Vehicle Park; Industry – High Impact; Office Ancillary to Permitted Use; Open Space; Plant Storage; Restaurant/ Café; Retail – Local <150 sqm nfa; Sustainable Energy Installation; Telecommunications Structures; Utility Installations; Waste Disposal and Recovery Facility (High Impact).</i> |

5.8.1 CUMULATIVE

The cumulative effect of the Proposed Development on Population and Human Health alongside other development due to take place in the area will be long term, significant and positive.

5.9 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

5.9.1 CONSTRUCTION PHASE

Effects on population and health during the Construction Phase are expected under different environmental topics and will be mitigated as described in the other relevant chapters throughout this EIAR. Once mitigation measures have been implemented the residual effects are expected to be limited to minor or insignificant levels as described in other associated residual impacts sections relating to the Construction Phase.

5.9.2 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered during the production of this chapter of the EIAR.

5.10 REFERENCES

- Central Statistics Office. Statbank Databases (Accessed August 2022, <https://www.cso.ie/en/databases/>).
- Central Statistics Office. Census of Population, 2011, 2016 and 2022. (Accessed August 2022, <https://www.cso.ie/en/census/>).
- Central Statistics Office. Labour Force Survey, 2020 (Accessed August 2022, www.cso.ie/en/statistics/labourmarket/labourforcesurvey/lf/).
- Environmental Protection Agency (2021) Licenced Sites Accessed March 2021, <http://www.epa.ie/licensing/>).
- Environmental Protection Agency (EPA). Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015).
- Environmental Protection Agency (EPA). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022),
- European Commission (EC). Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017).
- Fingal County Council. Fingal County Council Development Plan 2017-2023.
- Pobal HP Deprivation Index (Accessed August 2022, <https://data.gov.ie/dataset/pobalhp-deprivation-index>).
- Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU).

6 BIODIVERSITY

6.1 INTRODUCTION

6.1.1 OVERVIEW & AIMS

This report assesses potential impacts that may arise from the proposed power plant at Kilshane on biodiversity within the receiving environment, in accordance with the following guidance documents:

- Guidelines on Information to be contained in Environmental Impact Statement Reports. (2022) Environmental Protection Agency.
- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (2018). Chartered Institute of Ecology and Environmental Management (CIEEM), Ver. 1.1 Updated September 2019.
- Guidelines for Preliminary Ecological Appraisal. (2017) Chartered Institute of Ecological and Environmental Management (CIEEM), Second Edition.
- A Guide to Habitats in Ireland (2000), Fossitt JA.
- Best Practice Guidance for Habitat Survey and Mapping. (2011) The Heritage Council.

It aims to discuss the existing ecological environment, the potential impacts of the proposed development and avoidance and mitigation measures in relation to habitats, flora and fauna in the zone of influence (ZOI) of the proposed development area. A separate stand-alone AA Screening Report is also included in the planning application documentation.

6.1.2 LEGISLATIVE CONTEXT

Ireland's National Biodiversity Action Plan 2017–2021¹⁵, in accordance with the Convention on Biological Diversity, is a framework for the conservation and protection of Ireland's biodiversity, with an overall objective to secure the conservation, including, where possible, the enhancement and sustainable use of biological diversity in Ireland and to contribute to collective efforts for conservation of biodiversity globally. The plan is implemented through legislation and statutory instruments concerned with nature conservation. The Planning and Development Acts, 2000 (revised September 2020) and the European Communities (Environmental Impact Assessment) (Amendment) Regulations, 1989 to 1999 are particularly important in that regard and include a number of provisions directly concerned with the protection of natural heritage and biodiversity.

The Wildlife Acts, 1976–2012 are the principal mechanism for the legislative protection of wildlife in Ireland. They outline strict protection for species that have significant conservation value. In summary, the Wildlife Acts protect species from injury, disturbance and damage to breeding and resting sites. All species listed in the Wildlife Acts must, therefore, be a material consideration in the planning process. The Flora (Protection) Order, (2015) gives legal protection to certain species of wild flora, i.e., vascular plants, mosses, liverworts, lichens and stoneworts. Under the Order, it is an offence to uproot, damage, alter, or interfere with any species listed species listed within the Order, or to damage or alter their supporting habitats.

The European Communities (Birds and Natural Habitats) Regulations, 2011–2015 transpose into Irish law Directive 2009/147/EC (the Birds Directive) and the Habitats Directive, which list habitats and species of Community, i.e., European Union (EU), importance for conservation and that require protection. This protection is afforded in part through the designation of areas that represent significant populations of listed species within a European context, i.e., Natura 2000 sites. An area designated for bird species is classed as a Special Protection Area (SPA), and an area designated for other protected species and habitats is classed as a Special Area of Conservation (SAC). Birds listed in Annex I of the Birds Directive in SPAs and habitats and species listed in Annexes I and II, respectively, of the Habitats Directive in SACs in which they are designated features have full European protection. Species listed on Annex IV of the Habitats Directive are strictly protected wherever they occur, whether inside or outside European sites. Annex I habitats outside of SACs are still considered to be of national and international importance and, under Article 27(4)(b) of the European

¹⁵ NPWS: <https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf>

Communities (Birds and Natural Habitats) Regulations, 2011, public authorities have a duty to strive to avoid the pollution or deterioration of Annex I habitats and habitats integral to the functioning of SPAs.

Sites of national importance for nature conservation are afforded protection under planning policy and the Wildlife Acts, 1976–2012. NHAs are sites that are designated under statute for the protection of flora, fauna, habitats and geological interest. proposed NHAs (pNHAs) are published sites identified as of similar conservation interest but have not been statutorily proposed or designated.

The International Union for the Conservation of Nature and Natural Resources (IUCN) provides a global approach for evaluating the conservation status of species to inform and catalyse action for biodiversity conservation through the Red List of Threatened Species.

6.1.3 APPROACH TO ECOLOGICAL EVALUATION & IMPACT ASSESSMENT

Assessing impact significance is a combined function of the value of the affected feature (its ecological importance), the type of impact and the magnitude of the impact. It is necessary to identify the value of ecological features within the study area in order to evaluate the significance and magnitude of possible impacts.

The following parameters are described when characterising impacts (following CIEEM (2018), EPA (2017) and TII (2009, Rev. 2)):

Direct and Indirect Impacts: An impact can be caused either as a direct or as an indirect consequence of a Plan/Project.

Magnitude: Magnitude measures the size of an impact, which is described as high, medium, low, very low or negligible.

Extent: The area over that the impact occurs – this should be predicted in a quantified manner.

Duration: The time that the effect 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 take 15-60 years to be mitigated; and
- Permanent: The effects would take 60+ years to be mitigated.

Likelihood: The probability of the effect occurring taking into account all available information.

- Certain/Near Certain: >95% chance of occurring as predicted;
- Probable: 50-95% chance as occurring as predicted;
- Unlikely: 5-50% chance as occurring as predicted; and
- Extremely Unlikely: <5% chance as occurring as predicted.

The CIEEM Guidelines define 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 populations of the species for which it was classified (CIEEM, 2018).

The results of the ecological survey were evaluated to determine the significance of identified features located in the study area on an importance scale ranging from international-national-county-local. The local scale is approximately equivalent to one 10km square but can be operationally defined to reflect the character of the area of interest. Because most sites will fall within the local scale, this is sub-divided into three categories: high local importance, local importance, and local value. The criteria used for assessing the importance of ecological features are shown in Table 6.1.

Table 6.1 Criteria used in Assessing the Importance of Ecological Features

| Importance | Criteria |
|-----------------------|---|
| International | An internationally designated site or candidate site (SPA, cSPA, SAC, cSAC, Ramsar Site, Biogenetic Reserve). Also, sites which qualify for designation as SACs or SPAs, this includes sites on the NGO shadow list of SACs. |
| National | A nationally designated site or candidate site (NHA, pNHA). Sites which hold Red Data Book (Curtis and McGough, 1988) plant species. |
| County | Sites which hold nationally scarce plant species (recorded from less than 65 of the national 10km grid squares); unless they are locally abundant. Sites which hold semi-natural habitats likely to be of rare occurrence within the county. Sites which hold the best examples of a semi-natural habitat type within the county. |
| High Local Importance | Sites which hold semi-natural habitats and/or species likely to be of rare occurrence within the local area. Sites which hold the best examples of a high quality semi-natural habitat type within the local area. |
| Local Importance | Sites which hold high quality semi-natural habitats. |
| Local Value | Any semi-natural habitat. |

6.2 METHODOLOGY

6.2.1 DESK STUDY

A desktop review was carried out to identify features of ecological importance within the proposed development area and the wider environment. Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potential effect is not of any relevance or significance.

- Source(s) – e.g., pollutant run-off from proposed works.
- Pathway(s) – e.g., groundwater connecting to nearby qualifying wetland habitats.
- Receptor(s) – qualifying aquatic habitats and species of European sites.

Specific focus was put into the assessment of sensitive receptors of protected species/habitat features; as well as those of local or national importance. A source is any identifiable element of the proposal which is known to have interactions with ecological processes. Pathways are any connections or links between the source and the receptor. This report determines if direct, indirect or cumulative adverse effects will arise from the proposed development.

6.2.2 FIELD SURVEY

Data was collected during surveys conducted on the 3rd February and 5th May 2022. The data represents a multidisciplinary ecological walkover survey of the proposed site in Kilshane Cross, Dublin. A habitat survey of the site was conducted following standard guidelines set out in 'Best Practice Guidance for Habitat Survey and Mapping' developed by the Heritage Council of Ireland¹⁶. Habitats were classified using habitat descriptions and codes published by the Heritage Council in 'A Guide to Habitat Types in Ireland'¹⁷. Plant species nomenclature follows Rose's 'The Wild Flower Key: How to identify wild flowers, trees and shrubs in Britain and Ireland'¹⁸. A list of the dominant and notable plant species was taken for each habitat type. Particular emphasis was given to the possible occurrence of rare or legally protected plant species (as listed in Flora Protection Order 1999) or Red-listed plant species (Curtis & McGough 1985, Wyse Jackson *et al.* 2016).

¹⁶ Smith, George F., et al. "Best practice guidance for habitat survey and mapping." The Heritage Council: Ireland (2011)

¹⁷ Fossitt, J.A., 2000. A guide to habitats in Ireland. Heritage Council/ Chomhairle Oidhreachta

¹⁸ Rose, F., O'Reilly, C., Smith, D.P. and Collings, M., 2006. The wild flower key: how to identify wild flowers, trees and shrubs in Britain and Ireland. Frederick Warne.

Observations were made for fauna species present or likely to occur on site. Emphasis was placed on mammals and birds, and especially for species listed in the respective Red lists, namely; Gilbert *et al.* 2021¹⁹ (birds), and Marnell *et al.* 2019²⁰ (mammals). For mammals, the survey was focused on signs of their presence/activity, such as tracks, feeding marks and droppings, as well as any direct observations. Regarding bats, the main focus was on evaluation of suitable habitats to support roosting individuals or communities; however, an ecological assessment of habitat suitability was undertaken throughout the site. The assessment process undertaken for bats followed the BCT Guidelines²¹. Chapter 4 of these guidelines identify the approach to assess 'preliminary ecological appraisal for bats'. This chapter sets out methods for identifying habitat suitability which do not constitute assumptions. Based on the information from the assessment the survey effort requirements are identified.

Bird species were recorded by sight and sound during a bird point count conducted during the ecological walk over, following the Birdwatch Ireland Country Breeding Bird survey methods. In addition, all linear hedgerows were walked, and species were recorded. Particular attention was focused on areas within the site of high ecological value that interact or overlap with parts of the proposed site in Kilshane Cross, Dublin.

During all surveys, particular attention was given to assessing the presence of rare or protected species. Each species identified was assessed in term of the EU Habitat Directive (92/43/EEC), Bird Directive (2009/147/EC), the Wildlife Act (1976), the Wildlife Amendment Act (2000) and the Red Data Lists for threatened and protected species, published on the NPWS website²².

6.2.3 LIMITATIONS

The survey effort and assessment were deemed sufficient for the proposed site context and character and the proposed project therein. Therefore, overall, it is considered that there are no significant limitations to the present assessment of the ecological importance of the site.

6.3 THE PROPOSED DEVELOPMENT

The proposed development is to construct a 293 Megawatt power station and realign part of the Kilshane Road. The aspects of the proposed development relevant to this chapter will be discussed here, however a fully detailed project description for the proposed development is supplied in Chapter 4 *Project Description*.

Regarding changes to the receiving environment habitats, the proposed development's construction phase will result in the change from the current habitat of mostly crop land, with patches of overgrown agricultural monoculture grassland and scrub to bare soil and earth for the construction phase (as outlined in the PCMP accompanying this application). However, for the operational phase the proposed development will result in a change from the original site use as intensively managed monoculture crop systems, to a combination of hard surface/industrial complex, and understory woodland canopy landscaping of native species – which will be interspersed with native pollinator friendly planting of wildflowers, and areas of amenity grassland (see Landscaping Architects RFI response December 2022, for a detailed Green Infrastructure Plan outlining these aspects). There will also be an access route, resulting in the removal of small segments of hedgerow to facilitate the access point. Most of the hedgerow currently on site will be retained throughout the construction and operational phases (see Landscaping Drawing No. Landscape Plan-Dwg 01). There will be the demolition of a residential building in the north west of the site, with some small agricultural sheds. The majority of the change to the receiving environment will be the change in use of the crop system and patches of agricultural monoculture patches and scrub; to the proposed landscaping plan for the proposed development (Drawing No. Landscape Plan-Dwg 01), which contains much higher diversity of planting of native species and habitat mosaics than the current intensively managed majority of crop systems on site – and patches of overgrown agricultural monoculture grassland.

¹⁹ RGilbert, G., et al. 2021. Birds of Conservation Concern in Ireland 4: 2020–2026. Irish Birds, 43, pp.1-22.

²⁰ Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

²¹ Collins, J. (ed.) 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

²² NPWS website for protected species and habitats data accessed at: <https://www.npws.ie/maps-and-data>

6.4 RECEIVING ENVIRONMENT

6.4.1 OVERVIEW

The proposed site is located in an area that is composed of a majority of intensively managed crop systems, framed by hedgerows and treelines, in north-west Dublin County. The proposed site is partly bordered by the N2 dual carriageway on the eastern boundary, by the Huntstown Quarry on the southern boundary, and various industrial estates to the west. In a wider landscape context, the site is located just west of Dublin airport, at approximately 1.6km from the proposed site, it is surrounded by other areas of intensively managed agricultural grassland to the north and areas of commercial and industrial developments to the west and east.

The proposed site contains intensively managed crop systems which are of low value for biodiversity. However, there are areas of hedgerows, treelines and scrub which can provide refuge to local flora and fauna in the intensively managed agricultural landscape and sub-urban expanse of the immediate and surrounding areas.

6.4.2 ZONE OF INFLUENCE

The operational phase works are not anticipated to have any impacts beyond the plan boundary due to the proposed characteristics of the project and the character and context of the proposed site itself – i.e., mainly intensively managed crop systems with no direct surface hydrological connectivity with the surrounding area. The construction phase works have potential to have impacts beyond the boundary due mainly to noise, dust and artificial lighting. The operational phase has potential to cause impacts to the surrounding area due mainly to noise and air quality effects. Following the source-pathway-receptor model identifying the potential likely sources, a Zone of Influence (ZOI) was established taking in a 2km radius around the proposed site. Given the nature of the proposed works, effects are not foreseen to be significant beyond this distance.

6.4.3 HYDROLOGY

Surface water drainage and rainfall, is generally currently percolated through the site via grass and soil. The topographic survey has confirmed that the internal and boundary hedgerows does contain an old agricultural drainage ditch, which could convey flow to the Huntstown Stream to the east of the site (s8.3 and Figure 8.1). This drain is dry for most of the year (confirmed by vegetation that has colonised the banks and base of the drain (such as Common Ivy and Male Ferns) will only have flow during heavy rainfall events, and it will only be surface run off. Additional drainage ditches occur to the west of the site, and are outside of the project boundary. These ditches only serve the subject site and the agricultural fields immediately to the west, located between the subject site and the Kilshane Road, and are also dry for most of each year, and do not convey any permanent, established watercourse on site, upstream of the Huntstown Stream.

The Huntstown Stream generally flows in a north-easterly direction to join the River Ward at St. Margaret's Golf and Country Club, and the River Ward is a tributary of the Broadmeadow River, which in turn outfalls to the Irish Sea at the Malahide Estuary (Figure 8.3). Section 8.3.1 of this EIAR contains more details and mapping of the local hydrological environment.

6.4.4 DESIGNATED AREAS

In accordance with the European Commission Methodological Guidance (EC, 2001), a list of European Designated Sites that can be potentially affected by the works has been compiled. A dedicated Appropriate Assessment Screening, reviewing all European sites within an appropriate pathway consideration zone²³ of the project, was undertaken. A review of the conservation objectives and qualifying interests of these sites was undertaken in order to identify what habitats and/or species could be vulnerable to risk of impact from the proposed project. This was done by assessing whether any source receptor links existed between the qualifying interests of the proposed development site.

²³ A pathway consideration zone is the area which was used to identify sites in the receiving area which might have ecological pathways connected to the zone of influence. Any ecological pathways beyond 15km are anticipated to be landscape scale interactions and therefore significant impacts are not likely given the availability of alternate resources.

When assessing ecological impacts, the CIEEM Guideline recommend a 15km pathway consideration zone as an adequate assessor for potential effects. Due to the characteristics and scale of the proposed project, all other Natura 2000 sites and pNHA/NHA sites beyond threshold distances of 15km are considered to be of sufficient distance from the proposed site, that no significant effects could be caused either directly or indirectly or in combination with other plans or projects to their interest features. Any impacts caused by the proposed development have no valid impact pathway to transfer along to reach any of the receptor interest features. These sites are thus 'screened out' and not considered further.

A stand-alone Appropriate Assessment Screening Report is submitted separately to this assessment and expands on the potentially affected designated sites and their conservation objectives in more detail. Appendix 6.1 provides a list of all of the designated sites considered within the assessment arranged by distance from the proposed development - which are assessed as part of this report. Figure 6.1 displays the Natura 2000 sites within a 15km pathway consideration zone of the proposed project; hydrological pathways were considered beyond 15km also.

In addition to examining European sites, NHAs and pNHAs have been considered. Figure 6.2 displays the National sites within a 15km pathway consideration zone of proposed site. Although NHAs and pNHAs do not form part of the Natura 2000 Network, they often provide an important supporting role to the network, particularly when it comes to fauna species which often do not obey site boundaries. There are however, NHAs and pNHAs that are designated for features that are not important at an international level and thus may not interact with the Natura 2000 network.

The Malahide Estuary is a Special Protection Area (SPA), a candidate Special Area of Conservation (cSAC), a proposed National Heritage Area (pNHA) and a RAMSAR site.

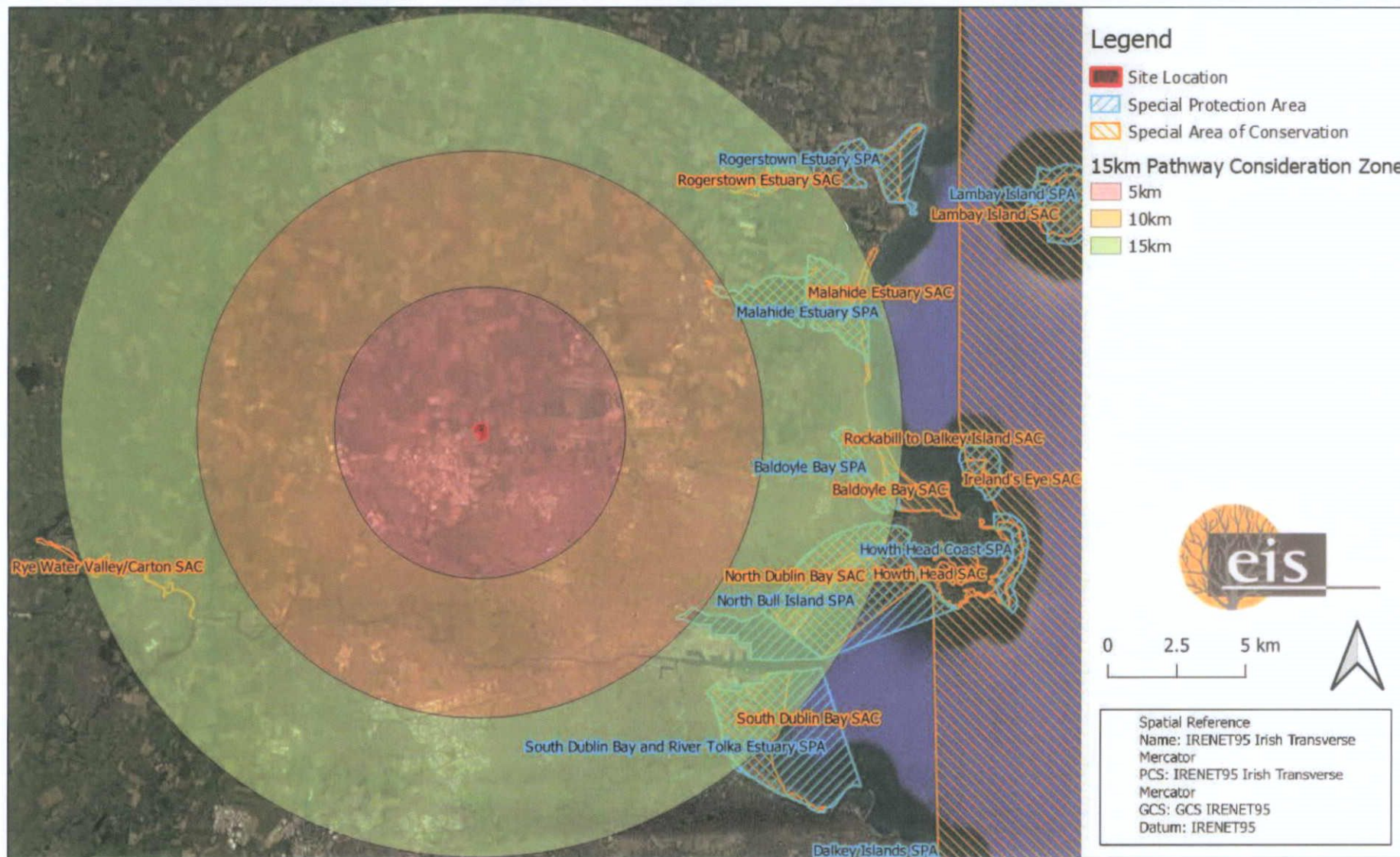


Figure 6.1 Natura 2000 sites within a 15km pathway consideration zone of the proposed development area

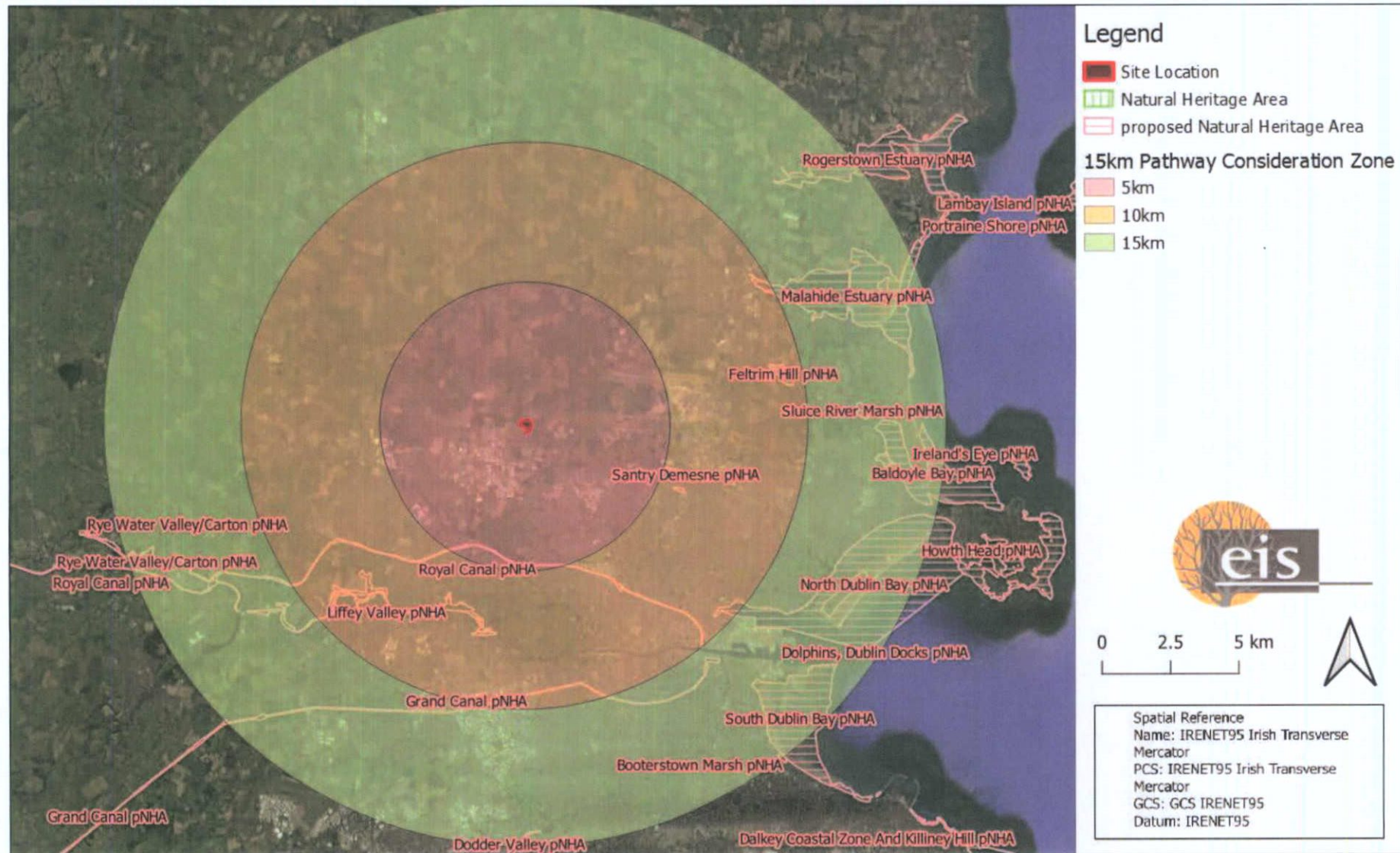


Figure 6.2 Natural Heritage Sites within a 15km pathway consideration zone of the proposed development area

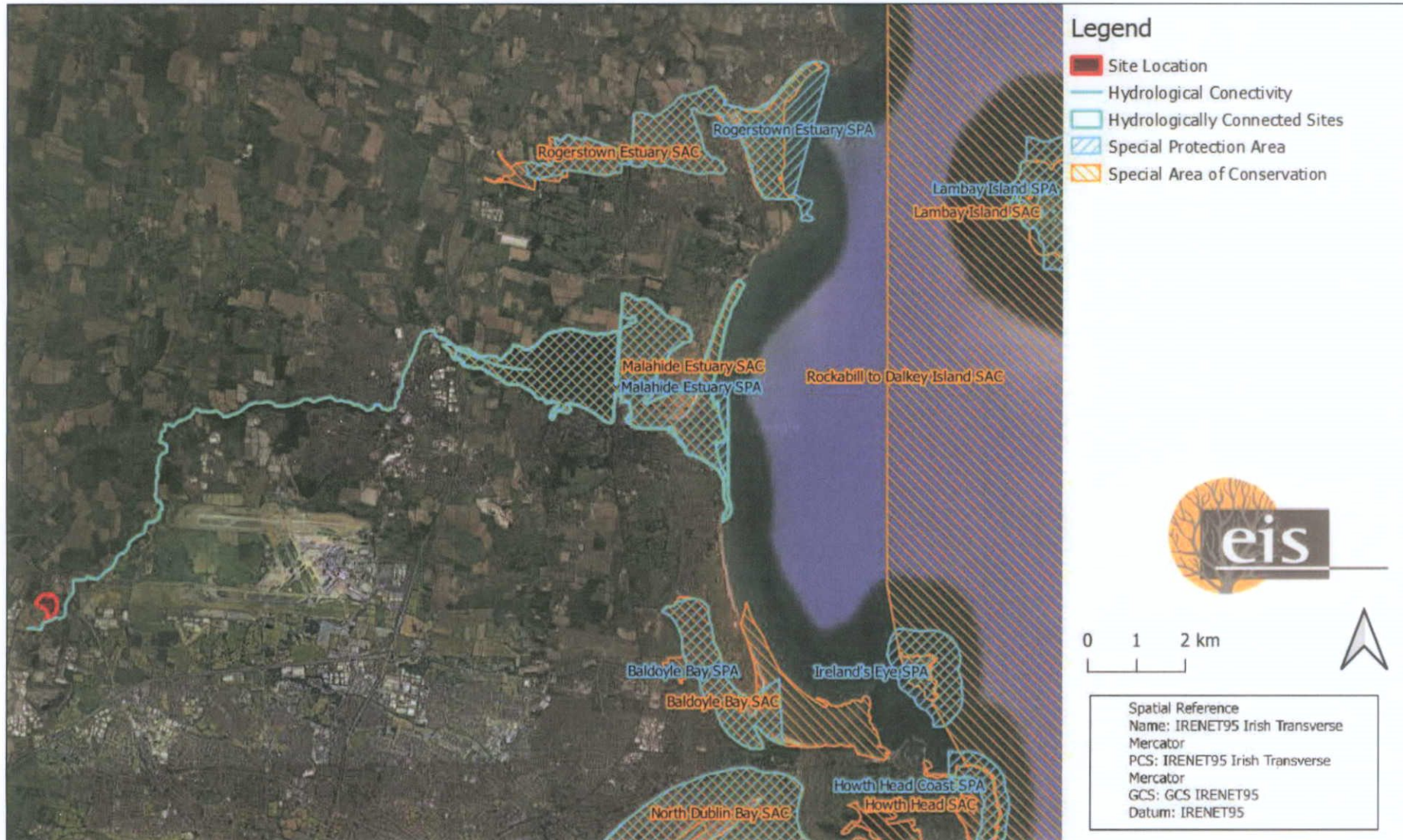


Figure 6.3 Huntstown Stream connectivity with European Sites

6.4.5 RECORDS OF PROTECTED, RARE OR OTHER NOTABLE FLORA & FAUNA SPECIES

The digital database of the National Biodiversity Data Centre (NBDC) was consulted to assess known records of rare, protected and invasive species that occur in the surrounding landscape. The collation of this information, as well as examination of aerial photographs allowed areas of potential ecological importance to be highlighted prior to field survey work. A search was undertaken of records of Red Data Book and Protected species held by the National Biological Data Centre (NBDC) database. A list of the rare and/or protected species recorded by the NBDC within the 10km x 10km grid square (O14) which contains the study area of this assessment, is provided in Appendix 6.2²⁴.

6.4.6 INVASIVE FLORA SPECIES

Publicly available NBDC data was accessed to identify invasive species in the 10km x 10km grid square which contains the study area (O14). 3 Of the flora species and 3 of the fauna species listed in Appendix 6.2, that have been recorded in the NBDC hectad O14 which contain the proposed development site, are subject to restrictions (Third Schedule) under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011.

6.4.7 FIELD SURVEY RESULTS

The findings of the ecological site visits on 3 February and 5 May 2022 are discussed below. A detailed habitat map is provided in Figure 6.4

6.4.7.1 Habitats & Flora

No Annex I habitats were found on site. The habitats present on the proposed site are of relatively low local importance in terms of support for local biodiversity and resource availability. But the habitats at the proposed site such as hedgerows can provide ecological connectivity for species in the surrounding area. There are multiple commercial and industrial developments in the surrounding area - which are of low to negligible ecological significance.

The habitats found on site, and their relative ratios, are typical of areas in which the proposed site is located; with the vast majority of habitats in the area consisting of arable crop systems (BC1), and agricultural grassland which has overgrown ((GA1). The remaining habitats in the area consist of hedgerows (WL1), treelines (WL2), spoiled and bare ground (ED2) and pockets of buildings and artificial surfaces (BL3). See Figure 6.4 a habitat map.

As mentioned above, the habitats in the proposed site are mainly composed of agricultural crop systems. Most of this is maintained and used for crop sowing and harvesting, and left as bare over turned soil in the winter months and is not suitable foraging habitat for SCI wintering species. The other agricultural grasslands in the area have been left overgrown and are dominated by perennial ryegrass monoculture swards. The mature treeline composed of cypress to the northwest of the proposed site, along with an area of scrub dominated by brambles, may offer a small amount of ecological value. The majority of hedgerows which border the agricultural grasslands are thin and patchy and more are immature individuals, therefore these fragments do not offer and significant value for the surrounding area in terms of ecological connectivity. They can however offer value for breeding birds in terms of foraging and roosting habitat, and nesting habitat in places. Similarly, the crop systems in the proposed site can offer value in terms of foraging habitat for breeding birds. The majority of hedgerows and treelines are being retained as part of the landscape plan for the proposed development. The habitats towards the south of the proposed site are currently impacted by disturbance from the quarry to the south of the proposed site in terms of significant levels of dust and noise disturbance – with noticeable layers of residue occurring on the foliage of treelines and hedgerows along the quarry, bordering the southern end of the proposed site.

The habitat types recorded, their distributions, and their ecological significance are aligned with what is expected of areas of intensively managed agricultural crop system and overgrown grassland. A comprehensive

²⁴ National Biodiversity Centre data. Accessed: 15th February 2022

habitat map of the proposed site is supplied in Figure 6.4, and a description of each of the habitats identified on site along with a species list for each can be found in Appendix 6.3.

6.4.7.2 Invasive Species

No invasive species were recorded during the ecological walkover in February or additional site visit in May 5th 2022. It is noted there are 6 of the invasive species recorded for the 10x10 km area within which the site is located by the National Biodiversity Data Centre which are subject to restrictions. Due to the majority of intensively managed agricultural grassland on the site, terrestrial invasive flora is not currently a threat to the site.

6.4.7.3 Fauna

Non-volant Mammals

No evidence of badger setts was found on site. There were also not any feeding or other signs of badger found along corridors and potential avenues for commuting within the site (i.e., hedgerows, treelines, and ditches). This indicates low use of the site by badger, especially given the optimum season for signs during which the survey was conducted. This finding is in keeping with the low ecological value of the site given the lack of suitable habitat and significant anthropogenic disturbance in the surrounding area from various forms of industry and development. It is likely that badger do not use the site as there are more favourable habitats in the surrounding area with more defined and mature treelines in less disturbed areas. No evidence of any other non-volant mammals was found on the site.

Bats

Bat activity transects were conducted after along hedgerows of the site on May 5th 2022. The site was found to have very low levels of bat activity in terms of feeding and commuting. This is in keeping with the low ecological value of the site and the fragmented and thin nature of the hedgerows and treelines within the site, combined with high levels of disturbance and night time lighting from the N2 dual carriageway on the eastern boundary and the Huntstown Quarry on the southern boundary of the proposed site – and wider context of multiple industrial estates surrounding the southern landscape of the proposed site.

All trees within the site boundary were inspected for potential bat roost features and only two features with potential to have bat roosting habitat were identified on site (Figure 6.5). Buildings on the site which will be subject to demolition as a result of the proposed project were also inspected for potential bat roost features and signs of previous or current use by bats as a roosting site, and found to have no bat roost potential or evidence of use.

A bat emergence survey was carried out at the potential roost features identified in May 5th 2022, and no bat activity was recorded at either potential bat roost feature that would indicate use as a roost. As there very low levels of activity in general recorded at the site during bat activity surveys, and the lack of evidence of previous use of these features as a roost, it is highly unlikely that these potential roosts could be utilised at other parts of the year as roosts by local populations. However, the results of the roost emergence surveys could be seasonal, as bat populations can utilise bat roosts over different seasons. Therefore, as a precautionary measure, mitigation is proposed for these potential bat roost features in s.6.5.1 below.

Birds

The scrub and hedgerow habitats to the north east of the site provides high local value for birds (Table 6.2). In addition to these areas in the north of the site, there are hedgerows bordering the agricultural crop systems and remnant agricultural grassland which may hold some ecological value for local birds, however, the majority of these hedgerows are thin and sparse and are not likely to hold much ecological value.

A bird point count focused on passerines was conducted on site, for a duration of 15 minutes – in addition to any treeline walks and opportunistic records of species during surveying. The bird species seen and heard were recorded and the results are provided in Table 6.2 below. 10 Species, in total, were recorded. 8 Of these

species are on the green list, 2 on the amber list and none on the red list of the Birds of Conservation Concern in Ireland²⁵.

²⁵ Gilbert, G., et al. 2021. Birds of Conservation Concern in Ireland 4: 2020–2026. *Irish Birds*, 43, pp.1-22.

Table 6.2 Bird Survey Results

| Scientific name | Common name | List status |
|---------------------------|---------------|-------------|
| <i>Pica pica</i> | Magpie | Green |
| <i>Turdus merula</i> | Blackbird | Green |
| <i>Erithacus rubecula</i> | Robin | Green |
| <i>Columba palumbus</i> | Woodpigeon | Green |
| <i>Corvus monedula</i> | Jackdaw | Green |
| <i>Corvus frugilegus</i> | Rook | Green |
| <i>Passer domesticus</i> | House Sparrow | Amber |
| <i>Fringilla coelebs</i> | Chaffinch | Green |
| <i>Parus major</i> | Great Tit | Green |
| <i>Larus canus</i> | Common Gull | Amber |

A wintering bird assessment was deemed unnecessary for this site after the multidisciplinary ecological site, visit for multiple reasons, as outlined below:

1. Lack of habitat suitability for SCI species due to a combination of significant continual disturbance from multiple intensive anthropogenic sources close to the proposed site – i.e., the active Huntstown Quarry directly south of the proposed site, the N2 dual carriageway directly to the east of the proposed site, and the low flying aircraft above the proposed site which are continually (approximately every 10-15 minutes) passing at low altitudes after taking off from Dublin airport which lies nearby, approximately 1.6km to the east.
2. The site is composed mainly of agricultural land that is intensively managed for the production of crop system monocultures, which are left as rotated open soil over the winter period – which is not suitable grazing habitat for SCI species in the growth, harvest or winter period. There are an additional two patches of remanet agricultural grassland within the proposed site, however these are minor in relative size to the site overall, and are overgrown dense grass/scrub mosaics, which are also unsuitable for ex-situ foraging SCI species. The only other habitat types within the proposed site are dry, disused agricultural ditches, and hedgerows / treelines – the majority of which are preserved in the proposed project's landscape plan and Green Infrastructure Plan.
3. Finally, in addition to the combination of significant noise and visual disturbance, and the lack of appropriate foraging habitat; there is also an abundance of suitable foraging habitat for ex-situ SCI species in the surrounding grassland dominated agricultural landscape to the north west and north east of the proposed site.

Therefore, as a result of ground truthing from a multidisciplinary ecological survey carried out on site in February 3rd, and an additional site visit carried out on May 5th 2022, the proposed site was deemed unsuitable for supporting ex-situ foraging habitat for wintering bird populations or Special Conservation Interest species to any degree that would require wintering bird surveys to be carried out for – or to have the potential to provide foraging habitat that would support SCI species populations to any degree that would be significant in terms of contributing to the conservation objectives for Special Conservation Interest species for the SPAs in Dublin Bay and the Malahide Estuary.

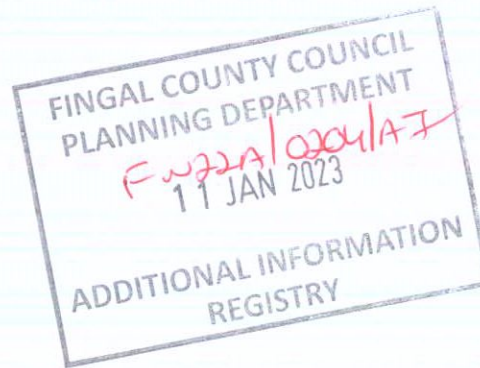
In summary, the site is of very low value as an ex-situ foraging resource for wintering bird populations or SCI species due to: 1. multiple neighbouring significant anthropogenic disturbances, 2. combined with the lack of suitable foraging habitat for these groups present on site, and 3. the abundant availability of suitable ex-situ foraging habitat for SCI species in the wider landscape to the north of the site and east of Dublin airport. This assessment is also reflected in and detailed in the AA screening accompanying this application.

Amphibians

No frogs were observed on site. No suitable habitat of any permanent significance for amphibians was recorded within the proposed site during the multidisciplinary survey of February 3rd. This is deemed significant survey effort as this survey was conducted during the winter period of high rainfall and flooding and thus in the optimum period for identify semi-permanent freshwater habitat on site. Therefore a dedicated amphibian survey was deemed unnecessary for this assessment.

Invertebrates

There were no habitats or food plants of potential significance to support invertebrate species assemblages of any local ecological significance, or to support any protected species. Therefore, a dedicated invertebrate survey was deemed unnecessary for this assessment.



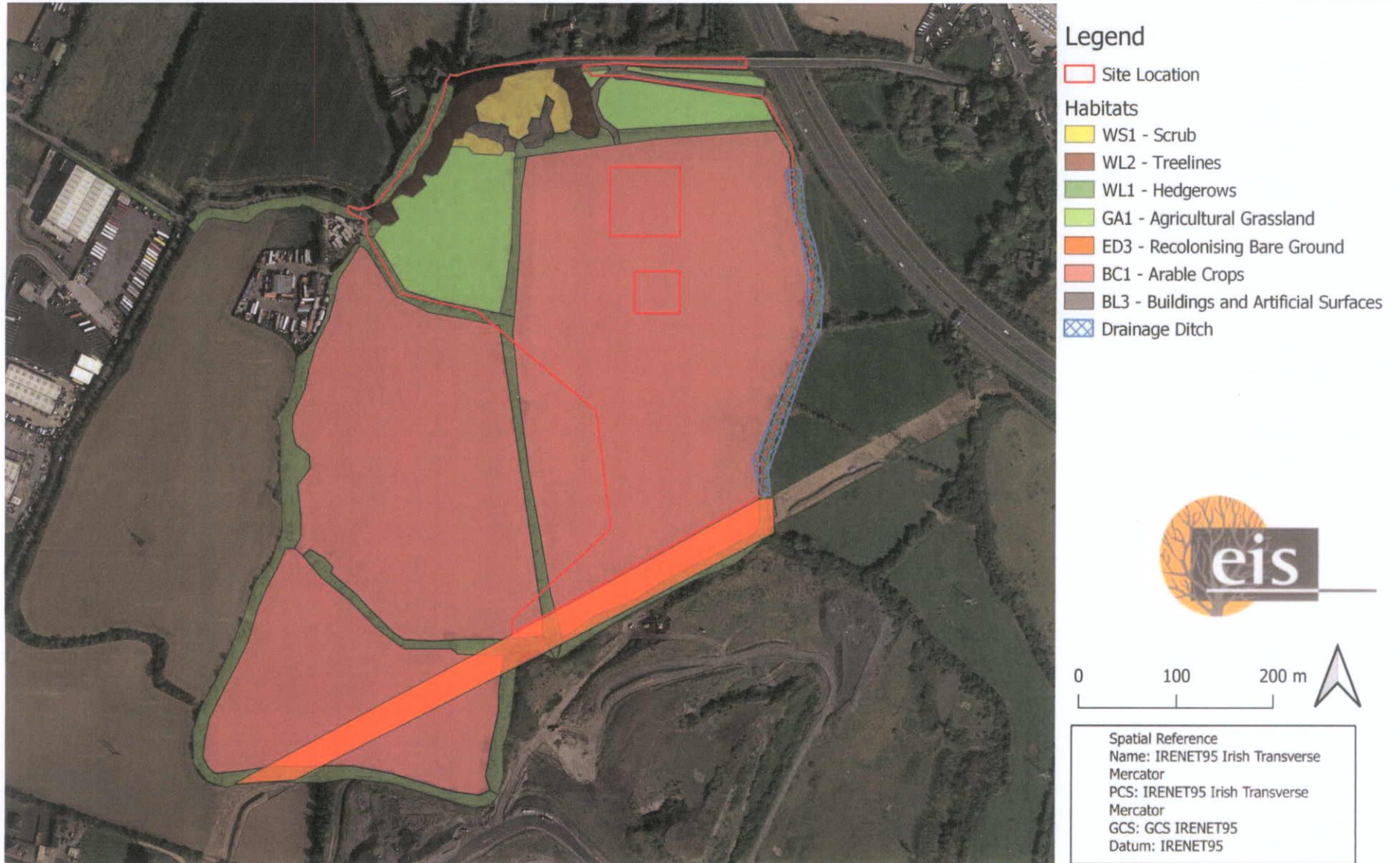


Figure 6.4 Habitat map using the Fossitt code ²⁶

²⁶ Fossitt, J.A., 2000. A guide to habitats in Ireland. Heritage.



Figure 6.5 Map of Potential Bat Roosts

6.5 POTENTIAL IMPACTS

Based on the baseline ecological environment of the proposed site, and the extent and characteristics of the proposed development, the following potential impact sources have been identified:

1. Augmentation of existing habitats, as well as the removal of some small areas of hedgerow/treeline
2. Construction and Earthworks
3. Lighting during construction
4. Noise/vibration
5. Emissions/Air pollution
6. Hydrology via surface water run-off
7. Climate

These potential impacts are discussed below:

6.5.1 AUGMENTATION OF EXISTING HABITATS, AS WELL AS THE REMOVAL OF HEDGEROWS

- The removal of any vegetation on site has potential to negatively impact breeding bird populations via reduction of available foraging, roosting or breeding habitat.
- Removal of vegetation could also result in a reduction in insect life, also indirectly affecting mammal and bird populations.

6.5.2 CONSTRUCTION & EARTHWORKS

- The proposed development could interact with local habitats via dust, soil removal, and construction disturbance.
- The demolition of existing buildings on site as part of the proposed development only has potential to interact with ecological features in terms of potential bat roost features for this site. As stated in s. s. 6.4.7.3 above, an inspection of these buildings marked for demolition for potential bat roost features, or evidence of current or previous use as a bat roost, was carried out and no evidence of any of the buildings on site was found for having potential as bat roost features.

6.5.3 LIGHTING DURING CONSTRUCTION & OPERATION

- Even though the site did not record any use of bat roosts, and had very low levels of foraging and commuting activity by bats, it is still prudent to assume that any strong lighting in the area of the proposed project implemented as a result of the project could impact species that use the site itself but also surrounding habitats for foraging and commuting, if not implemented with the appropriate ecological considerations.
- Bats, non-volant mammals, and birds are sensitive to any significant changes in lighting within semi-natural habitat in which they reside.

6.5.4 NOISE & VIBRATION

- The construction phase and movement of machinery could cause localised disturbance of breeding birds and wading birds that may use the habitats within the site area. However, there is likely to be an existing degree of habituation to human activity in the local areas due to the occurrence of Dublin airport nearby, the N2 dual carriageway, and the Huntstown quarry.
- Disturbance due to operational phase noise from the plant itself.

6.5.5 EMISSIONS & AIR POLLUTION

- Air pollution effects have potential to affect flora and fauna. However as shown in Chapter 9 of this EIA, changes in air quality are predicted to be imperceptible as a result of the proposed development.

6.5.6 HYDROLOGY

- A minor agricultural drainage ditch which is now dry runs along the eastern boundary of the site and leads to the Huntstown Stream (6.4). Even though this drain is mostly dry through the year (indicated by the vegetation which has colonised the drain banks and base), it must be considered as a potential hydrological link nonetheless; as the Huntstown Stream (which connects to the Ward River downstream), is linked to the drain (Apart from the aforementioned dry drainage ditch, there is no direct active surface hydrological connection between the proposed site and European sites.)
- This drain is characterised as dry most of the year due to the vegetation recorded to be colonising its banks and base during the ecological site visit (such as Common Ivy and Male Ferns).
- In the event of heavy rainfall, and considering the nature and activity of the proposed project and the distance of European sites, it is considered that heavy rainfall into this drain will still have negligible potential effects on the quality of downstream riverine habitats that are part of and connected to the Huntstown Stream (ref Chapters 7 and 8 also) due to the distances involved and the infrequent occurrence of flooding to a degree that would rewet the drainage ditch and connect to the Huntstown stream for a significant period of time.

6.5.7 CLIMATE

- Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years and considering various national and international Climate agreements and targets that the Irish Government is bound to, the proposed development has potential source for emissions in the context of current emissions and climate targets, that can inadvertently contribute to negative effects on biodiversity brought by climate change.
- Thus, considering the nature of the proposed development as a power station, this project has potential to contribute to the elements that establish and alter climate change, which can have varied effects on biodiversity - though their connection to a singular project can be difficult to establish, they must be considered.

6.5.8 POTENTIAL IMPACTS ON DESIGNATED SITES

The AA Screening Report accompanying this report sets out the likelihood and significance of any potential effects to European designated sites as a result of the proposed development in Kilshane Cross, Dublin. It finds that no significant adverse effects are foreseen to be likely to affect the ecological integrity of any European sites.

6.6 MITIGATION & MONITORING MEASURES

Considering the ecological characters and quality of habitats and features of the proposed site, the surrounding landscape context, and the nature and design of the proposed project, it is assessed that the implementation of the proposed development will have a short-term duration, and low magnitude impact (i.e., in terms of the habitat lost as a result of the proposed development - relative to the proposed landscape plan for the operational phase, and the proposed native habitat mosaics and species diversity therein, which are of higher biodiversity value than the current baseline of the site). However, the following mitigation measures are nonetheless proposed in order to ensure that the short-term, low magnitude impacts are avoided and/or minimised.

6.6.1 AUGMENTATION OF EXISTING HABITATS, AS WELL AS THE REMOVAL OF HEDGEROWS

- Vegetation removal during the breeding bird season (1st March to the 31st of August) will be avoided. Where this is unavoidable it will be subject to advice and supervision by a suitably qualified ecologist consulted prior to and during the work.
- No vegetation will be removed beyond the minimum required to complete the task.
- Timing of works affecting vegetation will be as brief as possible to minimise potential disturbance effects.
- The removal or management of trees on site as a result of the proposed development shall be carried out in accordance with the recommendations provided in the Arboricultural Impact Statement accompanying the application.
- Although the potential bat roost features identified on site recorded no activity during an emergence survey – this could be a seasonal effect as bats can use different roosts in different seasons. Therefore, as a precautionary measure, the areas identified as having potential for bat roost features (Figure 6.5) shall be surveyed again, prior to any construction work being carried out on site, by an appropriately qualified ecologist, to ascertain if there is any roosts activity within the features. The potential roost feature on the eastern boundary of the proposed site is a large tree that is being retained as part of the proposed development, and had a suitable lighting plan associated with the area. The roost feature that is in the centre north of the proposed site, is part of three non-native trees to be removed as part of the proposed landscaping plan and resulting from the arborist assessment and report. Therefore, in the unlikely event that a bat roost is identified at this centre north potential roost feature; the ecologist shall follow procedure as set out in the Bat Mitigation Guidelines for Ireland²⁷, and contact the NPWS as required.
- The operational phase of the proposed development will have a Landscaping Plan and a Green Infrastructure Plan which will outline a permanent diverse planting scheme and habitat mosaics mix composed of native species for the proposed site. Aspects of the landscaping plan which detail the planting of diverse native species and habitat matrixes are anticipated to mitigate against the permanent loss of foraging habitat for breeding birds which will occur due to the loss of the crop system habitat within the proposed site, along with scrub patches, and two areas of overgrown agricultural grassland. The planting scheme shall provide areas of native floral species planting, combined with mixed native grassland species planting, and native understory canopy planting.

6.6.2 CONSTRUCTION & EARTHWORKS

- During construction, dust controls will be implemented in accordance with the mitigation measures set out in Chapter 9.

6.6.3 LIGHTING DURING CONSTRUCTION & OPERATION

The below lighting measures will be put in place during both the construction and operational phases to ensure that there are no short to long-term effects on local bat populations as a result of the proposed development. The proposed site itself is of low value for local bat populations as evidenced by the activity survey, and potential roost features emergence survey. However, the below measures will ensure there is not significant increase in lighting that would potentially significantly impact the value of local bat commuter and foraging habitats as a result of the proposed development.

- Construction phase lighting will be controlled to minimise light pollution as a matter of good practice. Construction phase lighting controls will include the implementation of lights out hours when construction is not active on site (evening and night hours) (see section 6.6.3.1 below for lighting types).
- Operational phase lighting at night will be only be used where necessary and will be directional/cowled and at a low level where possible (see section 6.6.3.1 below for lighting types). Illumination of surrounding tree canopies will be avoided.
- Motion sensor activated lighting will be used where possible.
- Low height columns will be used where possible

²⁷ 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, Ireland

- All lighting will be cowled / directional away from hedgerows and away from any gaps in hedgerows (bat commuting routes)
- Lighting fixtures will be kept at least 5 m from hedgerows (from the outer edge of hedgerow spread and tree crowns)
- Lux levels at edges of retained hedgerows and hedgerow gaps (bat commuting routes) will be no more than 1.5 lux or no more than existing levels if lighting already exists²⁸ (See Table 6.3 below providing context for typical lux levels).
- Pre and post construction monitoring of lux levels will be carried out by lighting professional and compliance demonstrated in report form.
- New planting will be located to buffer light spill where motion sensor and low height columns recommended above are not possible.

6.6.3.1 Lighting Types

- Light emitting diodes (LEDs) will be used where possible²⁹.

Also possible for implementation are compact fluorescent lights, but only variants with a low UV output. These lower UV versions can similarly can be used at a low wattage with a lower impact on invertebrate populations and bats populations.

Table 6.3 Typical light lux levels

| Typical light lux levels | |
|----------------------------|--------------|
| Lighting type | Lux level |
| Typical road side lighting | ~ 5 |
| Minimum security lighting | ~ 2 |
| Twilight | ~ 1 |
| Clear full moon | ~ 0.25 - < 1 |

6.6.4 NOISE & VIBRATION

- Best practice measures for minimising and reducing noise and vibration from construction will be followed, as set out in the accompanying PCEMP.

6.6.5 HYDROLOGY

- The implementation of best practice regarding SUDS and surface water drainage systems on site as part of the construction and operational phases, are deemed adequate to ensure that there are no potential impacts to the hydrological quality of the Huntstown River or connecting rivers downstream.

6.6.6 CLIMATE

Chapter 9, "Air Quality and Climate", of this EIAR addresses the emissions from the proposed development in detail. However, the aspects of Chapter 9's emissions assessment which are relevant for this chapter are outline below:

Chapter 9, "Air Quality and Climate", of this EIAR addresses the emissions from the proposed development in detail. However, the aspects of Chapter 9's emissions assessment which are relevant for this chapter are outline below:

- The direct CO₂ emissions from electricity to operate the proposed power plant facility, will not be significant in relation to Ireland's national annual CO₂ emissions. The Sustainable Energy Authority of Ireland⁽³⁷⁾ states on its website that the average CO₂ emission factor for electricity generated from natural gas in Ireland was 202.2 gCO₂/kWh in 2020. On the basis that the proposed power generation

²⁸ 2018, Bat Conservation Trust. Guidance Note 08/18: Bats and artificial lighting in the UK. In particular Section 2 "Artificial Lighting". Available at: <https://www.bats.org.uk/news/2018/09/new-guidance-on-bats-and-lighting>

²⁹ 2010, Bat Conservation Ireland. Bats & Lighting, Guidance Notes for Planners, engineers, architects and developers. Available at: https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIrelandGuidelines_Lighting.pdf.

LEDs are easily directed and research indicates that their lower UV component than most other commonly used lighting attracts fewer invertebrates and thus reduces the effect on bat foraging, and the warmer white colour versions (preferably <2700 Kelvin) has peak wavelengths which cause less impacts on bat commuting while having little reduction in lumen output (preferably peak wavelengths higher than 550nm).

facility will generate a maximum of 293 MW of electricity using natural gas, which equates to 2,515 GWh annually. This translates to approximately 508,603 tonnes of CO₂eq per year. This scenario assumes that the facility will operate for 98% of the year, with a approx. 2% maintenance time. However, this "baseload" scenario would only occur in the highly improbable event of approx. 75% of all installed power generation across the market being unavailable, as described in Annex A of the AFRY assessment of the impact of the facility on the overall level of carbon emissions from the Irish power generation sector (Appendix 9.3 – "A comparison of future carbon emissions within the SEM with and without the Kilshane GT"). As described in Ch 4 - Project Description and Appendix 9.3, the facility is forecast to operate considerably less than this with a projected annual average of 46 hours. In both scenarios, the facility would replace operations of higher emitting power plants (particularly oil-fired units) resulting in an overall reduction of carbon emissions in the SEM.

- Overall, the impact on climate associated with the operational phase of the power generation facility is considered direct, long-term, positive and slight.

See Chapter 9 "Air Quality and Climate", for full detail on the assessment carried out of the potential climate impacts as a result of the proposed development.

6.7 RESIDUAL IMPACTS

There will be no net decrease in terms of the ecological integrity of the site due to supplemental planting of native understory woody species and native floral species as part of the landscaping plan for the proposed project – which will increase the biodiversity of the proposed site relative to the current receiving environment – and increase the ecological complexity and value of the site. These measures, in addition to the retention of the majority of hedgerows and treelines on site, and the implementation of a Green Infrastructure Plan in accordance with objectives of the County Development Plan, are predicted here to ensure that the potential impacts on flora and fauna during construction and operational phases of the proposed development will be of low magnitude (i.e., in terms of the habitat lost as a result of the proposed development - relative to the proposed landscape plan for the operational phase, and the proposed native habitat mosaics and species diversity therein, which are of higher biodiversity value than the current baseline of the site), and of a short-term duration.

The operational phase will be in keeping with the current function and usage of the surrounding landscape. Climate and the impact on emissions on air were also considered in this assessment (see Chapter 9 "Air Quality and Climate"), and it is deemed that there will be no residual impacts from emissions as a result of the construction or operational phases of the proposed development.

Therefore, considering the nature of the proposed development, the site context, the low magnitude, and short-term duration of the potential impacts of the proposed development assessed herein, in combination with suitable, site specific, tailored mitigation to address the potential impacts, residual medium to long-term impacts on the biodiversity and ecological integrity of the site are anticipated to be of negligible magnitude.

6.8 CUMULATIVE IMPACTS

6.8.1 PLANS OF RELEVANCE TO THIS PROPOSAL

Key plan of relevance in the context of this proposal:

- Fingal County Development Plan 2017-2023:

The proposed development site lies within a relatively industrialised area in Dublin, and is contained within lands zoned for industrial development within the Fingal County Development Plan. This plan has also undergone SEA and AA processes – and any in-combination effects identified therein will have been addressed by appropriate mitigation measures. Therefore, as there are no significant impacts associated with the proposed project to biodiversity, there are no cumulative impacts foreseen between the proposed development and the Fingal County Development Plan.

There are several proposed projects in the vicinity which are at planning stage or underway on various sites. A review of Fingal County Council's planning database for recent projects within the project area identified that

the projects within the area are large scale works predominantly relating to the construction of warehouses and industrial structures, and some medium scale projects relating to extensions and alterations of already existing structures (a list of recent planning applications is provided in Appendix 17.1 of this EIAR)

6.8.2 ADDITIONAL PROJECTS OF RELEVANCE TO THIS DEVELOPMENT

Projects in the immediate area that are of relevance to this project assessment in terms of cumulative impacts are listed below. These developments, will also be subject to EIA and AA assessments as required.

6.8.2.1 A. GIS and Grid Connection

The GIS substation will be located within the site that is the subject of this EIAR and will cause no significant additional or cumulative impacts on biodiversity. The Grid connection will mostly run under existing roadways and the section within the Kilshane Energy site will run under a roadway that forms part of the power station planning application. The connection will cause no significant impacts on biodiversity.

A dedicated Ecological Impact Assessment (EcIA) report on this is included in an Environmental Report (ER) which is appended to this EIAR (Appendix 17.2). This ER was prepared to support an application by Kilshane Energy to An Bord Pleanála for planning consent for that project (a Strategic Infrastructure Development).

6.8.2.2 B. AGI and Gas Pipeline

An Above Ground Installation (AGI) will regulate delivery of gas supply to the power station. This, and its associated gas supply pipeline, will be the subject of a separate consent process regulated by the Commission for Regulation of Utilities.

Similar to the GIS substation, the AGI will be located within the site that is the subject of this EIAR and will cause no significant additional or cumulative effects on biodiversity. The gas pipeline connecting it to the nearby gas main is likely to entail crossing two or three agricultural fields and their hedgerow field boundaries. It can be reasonably predicted that any ecological effects will be readily mitigated without causing any significant residual effects.

Therefore considering the nature of the proposed development, the site context, the low magnitude, and short-term duration of the potential impacts of the proposed development assessed herein, in combination with suitable site specific, tailored mitigation to address the potential impacts, no significant cumulative effects are anticipated during the construction or operational phases in-combination with the above plans or projects as a result of the proposed development.

7 LAND, SOILS, GEOLOGY & HYDROGEOLOGY

7.1 INTRODUCTION/ METHODOLOGY

This chapter assesses and evaluates the potential impacts of the Proposed Development on the land, soil, geological and hydrogeological aspects of the site and surrounding area, in accordance with the requirements of Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (i.e. the EIA Directive) (European Union, 2014a). This Chapter also provides a characterisation of the receiving hydrogeological environment within the subject lands and within a wider study area in the vicinity of the proposed development. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

This chapter was prepared by Marcelo Allende (BSc, BEng). Marcelo is a Senior Environmental Consultant (Hydrologist) at AWN with over 15 years of experience in Environmental Consulting and water resources. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide range of projects including multi-aspect environmental investigations, geo-environmental impact assessments, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments, Due Diligence reporting, baselines studies, soils, surface water and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama. He also has detailed knowledge of environmental guidance, legislation, regulations & standards and expertise in GIS (expert level) and MATTE studies at COMAH establishments. He is currently a member of the International Association of Hydrogeologists (Irish Group) and a member of Engineers Ireland (MIEI).

7.1.1 RELEVANT GUIDANCE

The hydrogeological baseline assessment has been carried out in accordance with the following guidance and established best practice:

- Environmental Protection Agency (EPA) Advice notes on current practice in the preparation of Environmental Impact Statement, Draft (EPA, 2015) and Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2022).
- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009).
- Water Framework Directive (WFD) - Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. This relates to the improvement of water quality across Ireland including rivers and groundwater bodies.
- River Basin Management Plan 2018-2021 (including regional plans by Local Authority Waters Programme (Waters and Communities 2020)). Draft River Basin Management Plan 2022-2027.
- Institute of Geologists Ireland (IGI) -Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).

Water resource management in Ireland is dealt with in the following key pieces of legislation and guidelines:

- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010).
- European Communities Environmental Objectives (Groundwater) Amendment Regulations 2016 (S.I. No. 366 of 2016); European Communities Environmental Objectives (Groundwater) (Amendment) Regulations 2022 S.I. No. 287 of 2022.
- Part IV of the First Schedule of the Planning and Development Act 2000, as amended.

- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)
- Environmental Protection Agency 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland Interim Report', (EPA 2003).
- European Union (Drinking Water) Regulations 2014 (S.I. No. 122/2014).
- European Union (Drinking Water) (Amendment) Regulations (S.I. No. 464 of 2017).

7.1.2 CRITERIA FOR RATING OF EFFECTS

This chapter evaluates the effects, if any, which the Proposed Development will have on Land, Soils, Geology and Hydrogeology as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).

The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this geological and hydrogeological assessment and classification of environmental effects.

Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013).

In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the standard EIA impact predictions table included in Chapter 1 which takes account of the quality, significance, duration, and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII criteria for rating the magnitude and significance of impacts on the geological related attributes and the importance of hydrogeological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-5 in Appendix 7.1.

The principal attributes (and effects) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the development site;
- Landfills, industrial sites in the vicinity of the subject site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well or requirement to remove it off-site as waste for disposal or recovery;
- High-yielding water supply springs/ wells in the vicinity of the subject site to within a 2km radius and the potential for increased risk presented by the Proposed Development;
- Classification (regionally important, locally important etc.) and the extent of aquifers underlying the site perimeter area and increased risks presented to them by the Proposed Development associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;

- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

7.1.3 SOURCES OF INFORMATION

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the subject site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Site Investigation Report. Kilshane, Ballycoolin, Dublin 15. Site Investigation Ltd., December 2021;
- Various design site plans and drawings; and
- Consultation with site engineers.

7.2 THE PROPOSED DEVELOPMENT

The proposed development site is located on a 13.56 ha site in the townland of Kilshane, and Piperstown, Kilshane Road, Dublin 11. The proposed development comprises the construction of a gas turbine power generator station with a maximum output of up to 293 MW, the application for which includes a turbine, an associated exhaust stack, two air cooled condenser units, administration and control building, workshop, stores, fuel gas area, electrical module for fuel gas area, step-up transformer, transfer compound, one fuel oil tank, one demin water tank and one raw water tank and recessed bund area, miscellaneous plant, and equipment, staff car parking spaces (10% of which will be EV charging spaces), site and landscaping works, and all associated ancillary site development infrastructure including foul and surface water drainage, internal roads, and footpaths, and all associated engineering and site works necessary to facilitate the development.

It is also proposed to realign a section of the Kilshane Road and construct a new roundabout junction as part of the works. The road realignment will tie into the existing road network in the public domain.

The proposed development is described in further detail in Chapter 4 *Project Description* and in the PCEMP. The details of the construction and operation of the development in terms of Land, Soils Geology and Hydrogeology are detailed in Table 7.1 below.