

4 RECEIVING ENVIRONMENT

This section details the desktop and field survey results, in order to describe the relevant receiving environment of the proposed development. The relevant receiving environment relates to anything that may be directly or indirectly related to the QIs/SCIs of relevant European sites.

4.1 European sites

A connectivity assessment of the proposed development and all QIs/SCIs of European Sites within 15km of the proposed development has been completed (refer to **Appendix A.1**). European sites found within the 15km buffer, but not considered further in this NIS due to the absence of connectivity, include:

- Skerries Island SPA (site code 4122), located c. 9.9km to the east;
- River Nanny Estuary and Shore SPA (site code 4158), located c. 9.9km to the northeast;
- Malahide Estuary SAC (site code 205), located c. 10.1km to the southeast;
- Malahide Estuary SPA (site code 4025), located c. 10.9 km to the southeast;
- Rockabill to Dalkey SAC (site code 3000), located c. 11.8km to the east; and
- Rockabill SPA (site code 4014), located c. 12.3km to the east.

The Rogerstown Estuary SAC (site code 208) and Rogerstown Estuary SPA (site code 4015) are considered within the Zol of the proposed development (refer to **Appendix A.1**). These sites are located circa 7.3km and c. 7.5km downstream from the proposed development site, respectively. There are no other European sites considered relevant to the Zol of the proposed development site.

4.2 Overview of Proposed Development Site

The proposed development site is located in north County Dublin, within a predominantly agricultural (tillage and pasture) landscape. Residential, and to a lesser extent commercial, properties are dispersed throughout the surrounding landscape. The proposed development site is bounded to the north by the Ballough Stream with the Knighstown Branch stream located c. 300m to the south. The southwest of the proposed development site (the location of the current compound and buildings) represents a local high point of the surrounding topography.

4.3 Habitats

4.3.1 Terrestrial

The proposed development site is dominated by artificial habitats resulting from quarrying activities, including: exposed sand, gravel or till; refuse and other waste spoil and bare ground; and buildings and artificial surfaces. As a consequence, recolonising bare ground is found throughout the site. Improved agricultural grassland is located in the north and east of the proposed development site, while semi-natural habitats of hedgerow, woodland and scrub are also present. Habitat descriptions (using Fossit, 2000) for the proposed development site are presented in **Appendix D**.

None of the terrestrial habitats overlapping or within the Zol of the proposed development are QIs of European sites. Terrestrial QI habitats of the Rogerstown Estuary SAC, including shifting dunes [2120] and fixed dunes [2130] (a priority habitat⁴) are outside the Zol of the proposed development. The nearest terrestrial QI habitat to the proposed development is fixed dunes, located c. 9.7 km southeast and downstream of the proposed development (NPWS, 2013a).

⁴ i.e. habitat types in danger of disappearance and whose natural range mainly falls within the territory of the European Union (EC, 2013).

4.3.2 Aquatic

Aquatic habitats within the proposed development site are dominated by artificial lakes and ponds, which are located throughout the site. Depositing lowland streams are located adjoining the proposed development site, to the north, and throughout the wider landscape. Non-QI riparian woodland has been identified to the north of the proposed development site, adjacent to the Ballough Stream. Habitat descriptions (using Fossit, 2000) for the proposed development site are presented in **Appendix D**.

Several aquatic habitats within the Zol of the proposed development are QIs of European sites. Aquatic QI habitats of the Rogerstown Estuary SAC, including estuaries [1130], mudflats and sandflats [1140]; *Salicornia* [1310], Atlantic salt meadows [1330]; and Mediterranean salt meadows [1410] are within the Zol of the proposed development. The nearest aquatic QI habitat to the proposed development is the Atlantic salt meadows, located c. 7.4km southeast and downstream of the proposed development site (NPWS, 2013a).

4.3.2.1 Watercourses

A search of the EPA online interactive mapping tool identified two watercourses within the Zol of the proposed development: the Ballough Stream (also referred to as the Tooman Branch stream) and the Knightstown Branch stream which flows into the Ballough Stream, south east of the proposed development site and ultimately discharges into Rogerstown Estuary.

The Ballough Stream is located adjoining the northern boundary of the proposed development site. A water quality monitoring station, located c. 2.5km downstream on the Ballough Stream (before the confluence with the Knightstown Stream), indicated that the water quality is 'moderate' (Q3-4; Ballough Stream Br W of the Five Roads; most recent results from 2001) (EPA, 2022a). The stream does not belong to the WFD waterbody monitoring network but flows into the EPA registered waterbody Ballough Stream_020, classed as *Moderate* WFD status (EPA, 2022b). The Knightstown branch stream flows approximately 500m south of the site and adjoins the Ballough Stream_10 approximately 2.5km southeast the site, classed as *Poor* WFD status (EPA, 2022b).

Further downstream on the Ballough Stream, c. 7km from the proposed development site at Corduff Bridge, the water quality is considered 'moderate' (Q3-4, most recent results from 2020) (EPA, 2022a). The Ballough Stream enters the transitional waters of the Rogerstown Estuary, c. 9km downstream of the proposed development site. These transitional waters are classed as *Bad* WFD status (2013-2018) (EPA, 2022b), and *Intermediate* WFD status in 2020 (EPA, 2022a).

The proposed development site is located within the Nanny-Delvin Catchment Management Unit (CMU) and the Ballough[Stream]_SC_010 sub-catchment.

4.3.2.2 Groundwater and Hydrogeology

The proposed development site lies within two groundwater bodies: Lusk-Bog of the Ring (IE_EA_G_014) and Hynestown (IE_EA_G_033), both locally important aquifers.

Most of the Lusk-Bog of the Ring groundwater body lies within a locally important aquifer, generally productive but there are smaller areas of karstified aquifer. The groundwater flow depends on the local karstified nature of the aquifer, since water will move along fractures and faults which can draw water very deep underground. However, the flow will be shallower and more diffuse in the larger groundwater body area, where limestone is not as karstified. This groundwater body is described as being composed of moderately permeable limestone units, which in some places are karstified (i.e. the fracture porosity is enhanced by solution). The Lusk-Bog of the Ring groundwater body is principally associated with the Loughshinny Formation and is characterised by groundwater flow along fractures and in places solution enhanced karstic conduits. The aquifers are typically considered to be unconfined but may be locally confined where overlain by Namurian strata. Recharge to the groundwater body is typically diffuse through subsoils and via outcrop (GSI, 2022a).

The northern part of the proposed development site lies on the Hynestown groundwater body, within a locally important aquifer, moderately productive in local zones. The groundwater flow is expected to occur at shallow depths, usually following the topographic gradient, converging into rivers and streams. The GSI describes this as typically being of low permeability except in localised areas of

enhanced permeability, e.g. associated with structural faulting. However, faulting of shales and mudstones can also result in fault gouges, which can serve to impede and divert groundwater flow locally (GSI, 2022b).

The water table within the proposed development site lies at or below the base of the quarry void, and rainwater infiltrates to the ground or runs off towards the deeper sections of the quarry pits.

The groundwater evidence base collated for the project illustrates that groundwater flow across the site is known to be south-easterly flow direction characteristic natural groundwater within the Loughshinny Formation. This flow is orientated towards the principal groundwater receptors which are identified as the local surface watercourses (including the Ballough Stream and the Knightstown Branch stream) (RPS, 2020).

The development site and its associated groundwater catchment area to the southeast are separate from the groundwater catchment of the Bog of the Ring wellfield by the groundwater divide demonstrated beneath the Knockbrack Hill high ground. This detailed evidence is included in the hydrogeological assessment presented in Volume IV of the EIAR accompanying this application (RPS, 2022). These results indicate that the Bog of the Ring wellfield and the landfill and hydraulically separated and the wellfield is not a groundwater receptors for the site (RPS, 2020).

4.4 Species

4.4.1 Avifauna

4.4.1.1 SCI Wintering Birds

There are a number of SCI bird feeding and roosting habitats downstream of the proposed development. The Rogerstown Estuary SPA is located 7.5km southeast of the Proposed Development. Rogerstown Estuary is an important winter waterfowl site and supports a population of Light-bellied Brent Goose of international importance.

There are potential pathways for LSEs to these features. These features (i.e. grassland feeding habitat, and intertidal mudflat habitats and adjacent shorelines for various wader and duck species) are discussed in detail, where relevant, in the Appropriate Assessment (**Section 5** and **Section 6**).

4.4.1.2 SCI Breeding Birds

Peregrine falcon, which is an SCI species, were recorded during the ecological desk (grid square O15N in 2011) and field study, and are known to breed within the proposed development site (NBDC, 2022; RPS, 2019). At the time it was identified in 2019, the peregrine falcon habitat was located within an excavated area, with average cliff face height of c. 35m, in the southwest corner of the proposed development site. This area has since been infilled and peregrine were not recorded in 2022. The nearest European site designated for SCI peregrine falcon is the Wicklow Mountains SPA (site code 4040), located c. 35.4km south of the proposed development. Core peregrine foraging ranges during breeding are estimated c. 2km (maximum c. 18km) in Britain (SHN, 2016); with reported pair density between 1.47 (Wicklow, Ireland) to 4.47 (Cumbria, England) per 100km² (Burke *et al.*, 2015).

The findings of the breeding bird surveys undertaken in 2019 indicated that bird activity was highest along the boundary of the site and also within the rough grassland fields in the east of the proposed development site. The finding of the ecological walkover undertaken in 2022 support this. The footprint of the proposed development site, i.e. where the proposed landfill cells and associated infrastructure are located, is considered to be of lower suitability to breeding birds when compared with the rough grassland and scrub/tree areas. Breeding evidence was recorded in 2019 for several species within the footprint of the proposed development including mallard and little grebe in addition to the peregrine falcon.

The next nearest known location of an SCI breeding bird is for kingfisher *Alcedo atthis*, within the River Boyne and River Blackwater SPA (site code 4232), c. 19.2km northwest of the proposed development.

4.4.2 Mammals

4.4.2.1 QI Bats

The proposed development is outside the favourable reference range of the lesser horseshoe bat *Rhinolophus hipposideros* (NPWS, 2019a; 2019c), which is the only bat species designated as a QI in Ireland. The species is restricted to the western Atlantic seaboard (NBDC, 2022), and has never been recorded in Co. Dublin. There are no SACs for the species within at least 150 km of the proposed development site. Maximum foraging ranges for the species from its SACs have not been recorded exceeding 6km in Ireland (e.g. 5.2km in Galway; Rush and Billington, 2014), or Wales (4.2km; Bontadina *et al.*, 2002). The range of this light-sensitive bat species of rural areas does not overlap with the Zone of Influence of the proposed development.

A bat habitat assessment survey was completed in May and June 2019 and three species of bats (common pipistrelle *Pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Leisler's bat *Nyctalus leisleri*) were recorded using the proposed development site. No evidence of the lesser horseshoe bat was recorded.

4.4.2.2 QI Otter

The NBDC database does not have any records of the presence of otter within the study area, which was confirmed by field survey. The field surveys carried out during the appropriate season (Autumn 2018, Spring 2019, Summer 2019 and Summer 2022) found no evidence of otter breeding or resting sites within the Zone of Influence of the proposed development site. Otter are known from the Knock Lake pNHA (site code 1203), located c. 3.5km northeast of the proposed development site. There is no surface water hydrological connectivity between the proposed development and this known otter location.

There is no SAC designated for QI otter within c. 18km of the proposed development site, or within the same CMU. In Ireland, the territory of female river otters has been estimated as 7.5 ± 1.5 km (6.5 ± 1.0 km in coastal environments (see Reid *et al.*, 2014)). The nearest designed site with QI otter is the River Boyne and River Blackwater SAC (site code 2299), c.18km northwest of the proposed development, and there are no SACs designated for QI otter within the same CMU as the proposed development.

4.4.3 Fish

QI Atlantic salmon *Salmo salar* and QI lamprey (*Lampetra fluviatilis*, *Lampetra planeri*, and *Petromyzon marinus*) records were not returned from the environmental data search from the NBDC. While the proposed development is within the favourable reference range of Atlantic salmon, Brook lamprey and river lamprey, it is outside the favourable reference range for sea lamprey (NPWS, 2019c). The nearest European sites designated for QI Atlantic salmon and QI lamprey are outside the CMU in which the proposed development is located. There is no freshwater hydrological links between the proposed development and these European sites.

4.4.4 Invertebrates

There are no suitable habitats for QI freshwater pearl mussel *Margaritifera margaritifera* or QI Irish freshwater pearl mussel *Margaritifera durrovensis* within the Zol of the proposed development. The habitat of freshwater pearl mussel in Ireland is restricted to near natural, clean flowing waters, often downstream of ultra-oligotrophic lakes (NS2, 2010). Pearl mussels require stable cobble and gravel substrate with very little fine material below pea-sized gravel (NS2, 2010). The Zol of the proposed development is outside the favourable reference range of QI pearl mussels (NPWS, 2019c). The nearest know population of QI pearl mussel to the proposed development are outside the CMU in which the proposed development is located. There is no hydrological links between the proposed development and these European sites.

There is no suitable habitat for QI marsh fritillary butterfly *Euphydryas aurinia* within the Zol of the proposed development. The Zol of the proposed development is outside the favourable reference range of QI marsh fritillary (NPWS, 2019c). The nearest European site with QI marsh fritillary butterfly

is Ballynafagh Lake SAC (site code 1387), located c. 44.5km southwest of the proposed development, which is outside the potential dispersal range of the species (i.e. c. 10km, according to Zimmerman *et al.*, 2011).

QI whorl snails (Geyer's whorl snail *Vertigo geyeri*; narrow-mouthed whorl snail *Vertigo angustior*; and Desmoulin's whorl snail *Vertigo moulinsiana*) records were not returned from the environmental data search from the NBDC. The Zol of the proposed development is outside the favourable reference range of QI whorl snails (NPWS, 2019c). The nearest known population of QI pearl mussel to the proposed development are outside the CMU in which the proposed development is located. There is no hydrological links between the proposed development and these European sites.

4.4.5 Flora

4.4.5.1 QI Plants

No QI plant species (petalwort *Petalophyllum ralfsii*; Killarney fern *Trichomanes speciosum*; marsh saxifrage *Saxifraga hirculus*; slender green feather moss *Hamatocaulis vernicosus* or slender naiad *Najas flexilis*) were recorded during the desk or field studies. The Zol of the proposed development is outside the favourable reference range of QI plant species (NPWS, 2019c). The nearest known population of QI plant species to the proposed development are outside the CMU in which the proposed development is located. There is no hydrological links between the proposed development and these European sites.

4.4.5.2 Invasive Alien Species

No invasive alien species, scheduled to the EC (Birds and Natural Habitats) Regulations 2011-2015, were recorded during the desk or field studies.

It is noted that the current licensed operations at the site permit the acceptance of soils contaminated with Japanese knotweed rhizome for biosecure disposal within the suitably designed and designed landfill cells on the site. This permission was granted by the EPA in 2018 under the terms of the existing Waste Licence (W0129-02).