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ECOLOGICAL IMPACT ASSESSMENT

CLONDALKIN RUGBY FOOTBALL CLUB LTD
DUBLIN 22

2022

REPORT NO:	PES_EcIA_ 21630	**AUTHOR:**	Ross Donnelly-Swift, PhD.
DATE:	08th August 2022	**REVIEWED:**	Mike Fraher, BSc.

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1.0 INTRODUCTION

This report has been prepared by Panther Environmental Solutions Ltd. to accompany an application for planning permission to South Dublin County Council by the applicant, Clondalkin Rugby Football Club Ltd. for the proposed redevelopment of agricultural land into sports pitches, training facilities and changing rooms, clubhouse, car and bus parking with all associated site works and landscaping works. The proposed site is located at Kingswood Farm, Baldonnell, Dublin 22.

Additional Information was requested on the 16th May 2022 for the proposed development (Ref: SD22A/0081). As per Item 2;

> *(i) The applicant is requested to submit an updated ecological survey report, with surveying being undertaken in the appropriate season, which coincidently is between April and September for plants and bats in particular. The bat survey is to be undertaken by a qualified and experienced bat expert and is to address the potential for the presence of bat roosts and the general usage of the site by foraging and commuting bats. Any buildings or outhouses proposed for demolition or reuse must also be surveyed for bat roost potential. A more comprehensive baseline of the ecological resource will facilitate a more robust assessment of the potential impact from lighting as proposed in this development. Flood lighting, in particular, is detrimental to the activities of many bat species, and this potential impact needs to be identified and addressed where necessary.*
> (ii) *The route of the Camac River also requires protection from any lighting proposals. Details of lighting and its potential impact on light sensitive species is required to be addressed at the earliest possible stage in the planning process, and not, as suggested in the ecological report, at the detailed design stage. A consideration of the need, location, intensity, and time of use of flood lighting is best considered early, so that amendments to drawings can be facilitated where necessary to protect bats and other sensitive habitats. Therefore, the applicant is requested to submit information on detailed lighting designs and usage, so that an appropriate assessment of potential impacts on protected species and the Camac River can be undertaken.*

This report will also take cognizance of the additional items requested in particular the Arboricultural Impact Assessment and Landscape Plan (Item 3).

The scope of this study is to assess whether significant impacts on protected flora and fauna with a particular emphasises on protected species found within the proposed development and with cognizance for National Heritage Areas (NHAs) and to identify and/or mitigate any potential significant effects on protected species. This report has been prepared with regards to the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), and the later amendment regulations (S.I. No. 233 of 1998; S.I. No. 237 of 2005).

A study was undertaken by Dr Ross Donnelly-Swift who has a BSc (Hons) in Biology from Maynooth University NUI, an MSc in Environmental Science from Trinity College Dublin and a PhD in Biosystems Engineering from University College Dublin. In addition, Ross was a Research Fellow in the Geography Department of Trinity College Dublin and Lecturer on Soil Science, Agroecology and Hydrology at Dundalk Institute of Technology. The completion of this report comprised of a review of the proposed development and site assessments on the 26th November 2021 and 13th July 2022 to examine the ecological context of the proposed development, a desk study of the information on protected species, habitats and sites within the vicinity of the development for the potential impacts.

2.0 LEGISLATIVE CONTEXT

The following legislation is relevant to the proposed development and biodiversity:

- The Wildlife Act is the primary piece of Irish legislation providing for the protection and conservation of wildlife and provides for the control of specific activities which could adversely affect wildlife, for example the regulation of hunting and wildlife trading. Under the Wildlife Act, all bird species, 22 other fauna species and 86 flora species in Ireland are afforded protected status. The Wildlife Act, 1976 allows for the designation of specific areas of ecological value such as Statutory Nature Reserves and Refuges for Fauna. The Wildlife (Amendment) Act, 2000 provides for greater protection and conservation of wildlife and also provides for the designation and statutory protection of Natural Heritage Areas (NHA). European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) and (Amendment) Regulations, 2015 (S.I. No. 355 of 2015), transposing the Habitats Directive 92/43/EEC (as amended) and Birds Directive 2009/147/EC.

- The Flora (Protection) Order, 2022 (S.I. No. 235 of 2022). This order provides statutory protection to flora listed in Section 21 of the Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000. Under the Order, it is illegal to wilfully cut, uproot or damage the listed species or interfere in any way with their habitats.

- National Biodiversity Plan 2017-2021. Ireland's third National Biodiversity Plan 2017–2021, identifies actions towards understanding and protecting biodiversity with a vision that, "*biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally*". A number of Local Biodiversity Action Plans have been prepared, and it is noted that the South Dublin County Development Plan (CDP) includes a policy to carry out a Biodiversity Plan during the lifetime of the CDP.

- National Biodiversity Data Centre All-Ireland Pollinator Plan 2021-2025. This plan has six objectives (i) Making farmland pollinator friendly, (ii) Making public land pollinator friendly, (iii) Making private land pollinator friendly, (iv) All-Ireland Honeybee Strategy, (v) Conserving rare pollinators (vi) Strategic coordination of the Plan.

- Water Framework Directive (2000/60/EC). The Water Framework Directive (WFD) aims to improve the water environment (including groundwater, rivers, lakes, estuaries and coastal waters) of E.U. Member States. The aim of the WFD is for Member States to achieve and maintain "good status" in all water bodies.

- South Dublin County Development Plan 2016-2022. Under these regulations, development plans must include mandatory objectives for the conservation of natural heritage and for the conservation of European sites.

3.0 METHODOLOGY

This Ecological Impact Assessment has been carried with reference to the following guidelines:

- *Appropriate Assessment of Plans and Projects in Ireland. Guidelines for Planning Authorities*. DoEHLG, 2009.
- Ecological Guidance for Local Authorities and Developers (Scott Cawley, 2013)
- *Managing Natura 2000 sites – The Provisions of Article 6 of The Habitats Directive 92/43/EEC.* European Commission, 2000.
- NRA (2009) *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority)
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites. Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, 2002.
- Commission Notice "Managing Natura 200 sites, The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, 21.11.2018
- CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.
- *The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (National Roads Authority (NRA), 2010);
- *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA, 2006a);
- *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (NRA, 2006b);
- *Guidelines for the Treatment of Bats during the Construction of National Road Schemes* (NRA, 2006c);
- *Bat Mitigation Guidelines for Ireland* (Kelleher and Marnell, 2006);

3.1 METHODOLOGY GUIDELINES

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time and is limited by various factors such as the season, timing of the survey, climatic conditions and species behaviour. Ecological surveys are therefore snapshots in time and should not be regarded as a complete study. Direct observations or evidence of protected species is not always recorded during ecological surveys. However, this does not indicate that the species is absent from the site. To ensure any limitations encountered did not significantly impact upon the findings of the ecological assessments, the ecological surveys undertaken also assessed the potential of the habitats to support protected species, and cognisance has been taken of available online baseline data (e.g. flora and fauna records from the NBDC, previous surveys undertaken by Wildlife Surveys) and a precautionary approach taken.

Desktop research was carried out to gather information on the ecology of the site and surrounding areas. The locations of the Natura 2000 sites, National Heritage Areas (NHAs) and protected flora and fauna records for the proposed development at Kingswood Farm, Baldonnell, Dublin 22.

Water quality data from the EPA was reviewed for the assessment of biological and environmental data collected on waterbodies in Ireland as per the Water Framework Directive (WFD) Monitoring Programme of River Ecology Monitoring Results (2020).

Biological records from the National Biodiversity Data Centre (NBDC) for the site and surrounding area (10km grid square/tetrad) were reviewed and account taken of notable species including any rare, protected, threatened and invasive species.

Information on the characteristics of the Natura 2000 sites within the potential zone of influence was reviewed from the conservation objectives documents, site synopses and Standard Natura 2000 data forms available on the NPWS website.

3.2 HABITAT SURVEY OF SITE

A site characterisation assessment was undertaken on the 26th November 2021 and 13th July 2022 to examine the ecological context of the development site, by systematically walking the site, adjacent land and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.,* 2011). Bird species and signs of fauna activity and dwellings were also noted. Particular attention was given to the possible presence of habitats and/or species, which are legally protected under Irish and European legislation and to assessing any potential ecological connectivity with Natura 2000 sites or supplementary or steppingstone habitats of relevance to Natura 200 sites.

3.2.1 Study Area / Zone of Influence

Following guidance set out by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and the National Roads Authority (2009), a Zone of Influence should be determined, which identifies the area in which the development could potentially impact upon ecological receptors and aquatic environments. The zone of influence takes into consideration the assigned ecological value of the receptors, which ranges from international, national, county to local, and potential pathways for impacts to occur. The zone of influence also takes into consideration the any watercourse surrounding the proposed development.

Taking into consideration best practice guidance and the nature of the development, the study area for the assessment ranges from the site boundary for habitats, to buffers of 100m for specific species. However, it should be noted that these buffers were extended where required.

Fauna & Otter Survey

Fauna surveys were undertaken during bright and dry weather conditions. Direct observation methods were used for the survey of fauna, however, these methods may not be suitable for shy and nocturnal species. Therefore, indirect methods were also employed, focusing on evidence of fauna including tracks, burrows/setts/nests, droppings, food items and hair. The habitats on site were assessed for signs of usage by fauna, and the potential to support protected or red-listed species.

Badger Survey

Badgers and their setts are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. The removal of badgers from affected setts and subsequent destruction of these setts must be conducted under licence by experienced badger experts or other suitably qualified personnel. The complete proposed route was assessed for the presence of a badger sett. Badger activity was not found within or adjacent the site boundary. Typically, the main setts of a badger, which are the focus of the social groups, are usually larger than other setts, averaging seven entrances each (Smal, 1995). A badger sett is divided into different types with main setts used for breeding and have multiple entrances. With outliers usually have one entrance and lie towards the fringes of their territory (Lowen, 2016).

Bat Survey

See accompanying Bat Assessment Report by VEON Ecology Ltd for a complete assessment of bat activity at the site and detailed survey methodology on monitoring of foraging bats and inspection of trees, hedgerows, buildings and bridges for a potential roost.

Bird Survey

General bird usage of the development site was assessed on the 26th November 2021 and 13th July 2022. While walking the development site, stops were undertaken on a regular basis during which time the area was scanned as far as the terrain or weather conditions allowed. Birds were identified by visual sightings and auditory identification of songs and calls. Birds flying overhead were also included as part of the survey. Birds observed while undertaking habitat and specific fauna surveys were also noted.

Invertebrate surveys (terrestrial)

Terrestrial habitats within the study area are considered unlikely to support any protected invertebrate species, as the study area does not support the food plants of the protected Marsh Fritillary (*Euphydryas aurinia*) or suitable habitat for protected Whorl snail species (*Vertigo* spp.).

Aquatic surveys

The Camac River and Baldonnell Upper were surveyed for aquatic fauna with general observation for fish and instream investigation of river bed and substrate for the presence of aquatic invertebrates.

Survey Limitations

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time and is limited by various factors such as the season, timing of the survey, climatic conditions and species behaviour. Ecological surveys are therefore snapshots in time and should not be regarded as a complete study. Direct observations or evidence of protected species is not always recorded during ecological surveys. However, this does not indicate that the species is absent from the site.

The optimal habitat survey period runs from April to September, the growing season for the majority of plants (Smith *et al.*, 2011). Weather conditions were suitable for bat surveys and nocturnal animals. To ensure any limitations encountered did not significantly impact upon the findings of the ecological assessments, the ecological surveys undertaken also assessed the potential of the habitats to support protected species, and cognisance has been taken of available online baseline data (e.g. flora and fauna records from the NBDC and BSBI, reviewing BCI bat records, previous surveys undertaken by Wildlife Surveys) and a precautionary approach taken.

4.0 DESCRIPTION OF PROPOSED DEVELOPMENT AND EXISTING SITE

4.1 PROPOSED DEVELOPMENT

The proposed development of the site will be the redevelopment of agricultural land into sports pitches. Existing industrial/agricultural buildings within the site boundary will be redeveloped for club facilities such as training facilities and 4 No. changing rooms. Also, as part of the proposed development will be a new two-story Clubhouse Pavilion, 117 car and 3 bus parking spaces, amenities, and a playground in addition to all associated site works and landscaping works. Vehicular access will be from the Baldonnel Road (L2001) approximately 880m from Grange Castle Road (R136). Some minor demolition work will take place to improve site access.

The proposed site is located at Kingswood Farm, Baldonnell, Dublin 22. See Figure 4.2 below.

To create playing fields the areas of agricultural grassland will be resown with grass species specifically grown for pitches such as Ryegrasses (*Lolium* spp.) and Fescue (*Festuca* spp.) with the removal and/or treatment of deep-rooted recolonising flora such as Broad-leaved Dock (*Rumex obtusifolius*) and Dandelion (*Taraxacum* spp.). Pitch development involves rolling, seeding and cutting. Once the grass pitch is established it can be marked out and posts erected. Field levels will be unchanged. Vegetation cover of the overall site is shown in imagery captured in 2009 and 2020. See Figure 4.2 below

An additional site entrance would also be provided onto the local access road.

As part of the development waste water will connect to the municipal sewer line via a new connection. This pipe will cross under the Camac River to the north-west of the proposed units. Pipework underneath the Camac River would be installed using a Horizontal Directional Drilling (HDD) method, which would prevent any surface excavations (excluding the pipe entrance and exit) and works within the riparian zone and stream bed. A drawing of the watercourse crossing design has been included in Appendix A.

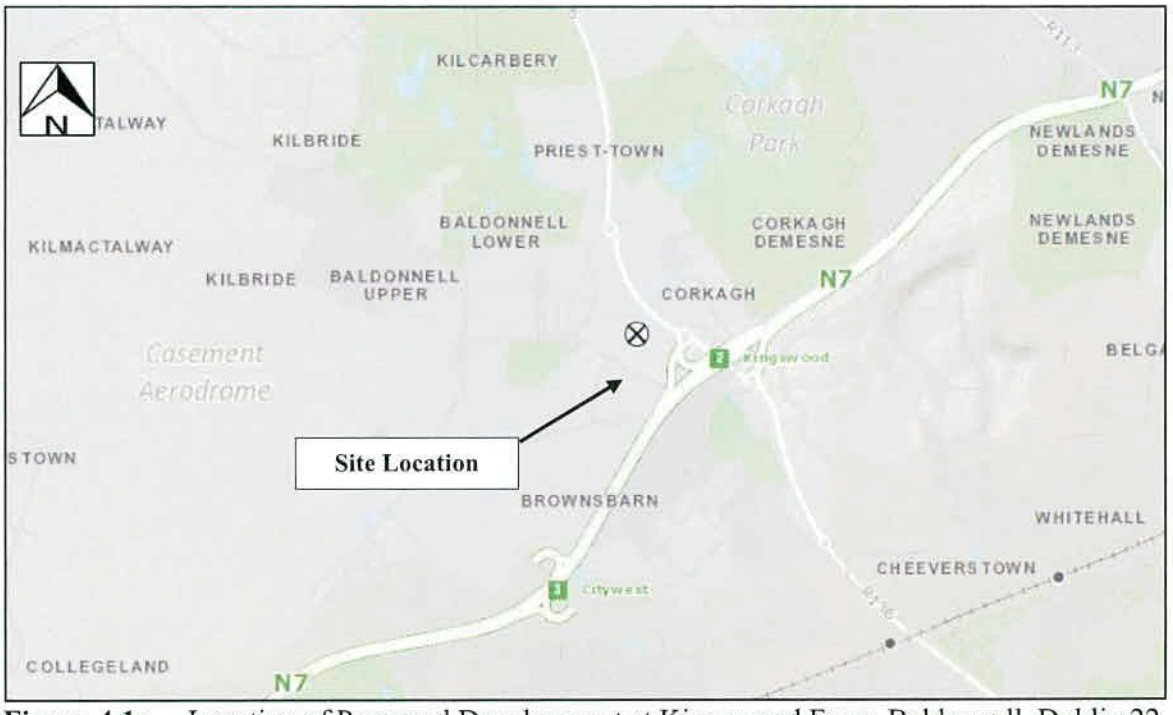

Figure 4.1: Location of Proposed Development at Kingswood Farm, Baldonnell, Dublin 22

Figure 4.2: Vegetation at the proposed site (i) 2009 (ii) 2022 (Source Google Imagery) within the boundary of the proposed development.

4.2 EXISTING ENVIRONMENT

During the site survey seven habitats were identified;

Recolonising Bare Ground (ED3)
Within the site is recolonising bare ground (ED3) habitat. The dominant species found here are Buttercup (*Ranunculus* spp.), Clover (*Trifolium* spp.), Sow-thistle (*Sonchus* spp.), Dock (*Rumex* spp.), Nettle (*Urtica dioica*), Rape (*Brassica napus*), Greater Plantain (*Plantago major*), Ragwort (*Senecio jacobaea*), Dandelion (*Taraxacum* spp.), Annual Meadow-grass (*Poa annua*), Pineappleweed (*Matricaria discoidea*), Fat-hen (*Chenopodium album*) and Poppy (*Papaver* spp.).

Figure 4.2.1 Recolonising Bare Ground (ED3) (Nov & July)

Buildings and Artificial Surfaces (BL3)

Large areas of concrete and the outbuildings/sheds site are classified as buildings and artificial surfaces (BL3) habitat with few flora species present such as Moss (*Bryophyta*), Groundsel (*Senecio vulgaris*), Ivy (*Hedera helix*), Annual Meadow-grass (*Poa annua*) and Dandelion (*Taraxacum* spp.). Additional seedlings of flora found in ED3 habitat.

Figure 4.2.3 Buildings and Artificial Surfaces (BL3) (Nov & July)

Hedgerows (WL1) and Treelines (WL2)

Along the field boundaries are hedgerows (WL1) and treelines (WL2) habitats with tree species Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), Horse-chestnut (*Aesculus hippocastanum*) and Willow (*Salix* spp.). Other species found in this habitat are Holly (*Ilex aquifolium*), Dog-rose (*Rosa canina agg.*), Bramble (*Rubus fruticosus*), Ivy (*Hedera helix*), Cleavers (*Galium aparine*), Nettle (*Urtica dioica*), Hogweed (*Heracleum sphondylium*), Lesser Burdock (*Arctium minus*), Hedge Mustard (*Sisymbrium officinale*), Herb-Robert (*Geranium robertianum*), Primrose (*Primula vulgaris*), Tutsan (*Hypericum androsaemum*), Vetch (*Vicia* spp.), Violet (*Viola* spp.), Hart's Tongue Fern (*Asplenium scolopendrum*), Moss (*Bryophyta*) and Privet (*Ligustrum* sp.). See accompanying Arboricultural Report for assessment of treeline and hedgerow habitats.

Figure 4.2.2 Hedgerows (WL1) and Treeline (WL2) habitats (Nov & July)

Mixed broadleaved/conifer woodland (WD2)

Mixed broadleaved/conifer woodland (WD2) habitat is found along the boundary with the N7 slip road and L1021 with Ash (*Fraxinus excelsior*), Birch (*Betula* spp.), Hazel (*Corylus avellana*), Scot's Pine (*Pinus sylvestris*), Willow (*Salix* spp.), Guelder-rose (*Viburnum opulus*), Hawthorn (*Crataegus monogyna*) with Ivy (*Hedera helix*) and Bramble (*Rubus fruticosus*).

Figure 4.2.3 Mixed broadleaved/conifer woodland (WD2) (Nov & July)

Agricultural Grassland (GA1)

This habitat is the found in the fields to the north of the site. The flora found here include Ryegrasses (*Lolium* spp.), Bent grasses (*Agrostis* spp.), Meadow-grasses (*Poa* spp.), False Oat-grass (*Arrhenatherum elatius*), Creeping Buttercup (*Ranunculus repens*), Clover (*Trifolium* spp.), Creeping Thistle *(Cirsium arvense*), Common Mouse-ear (*Cerastium fontanum*), Daisy (*Bellis perennis*), Dandelion (*Taraxacum* spp.), Ragwort (*Senecio jacobaea*), Broad-leaved Dock (*Rumex obtusifolius*), Shepherd's-purse (*Capsella bursa-pastoris*), Spear Thistle (*Cirsium vulgare*), Sow-thistle (*Sonchus* spp.) and Nettle (*Urtica dioica*).

Figure 4.2.4 Agricultural grassland (GA1) (Nov & July)

Amenity Grassland (GA2)

This habitat is found along the middle field south of the Camac River. The grass species are Ryegrasses (*Lolium* spp.) and Fescue (*Festuca* spp.) with Clover (*Trifolium* spp.), Common Chickweed (*Stellaria media*) and Common Fumitory (*Fumaria officinalis*).

Figure 4.2.5 Amenity grassland (GA2) (Nov & July)

Depositing/lowland rivers (FW2)

The Camac River is classified as depositing/lowland rivers (FW2) habitat. The flora found here include Water-cress (*Rorippa nasturtium-aquaticum*), Lesser Water-parsnip (*Berula erecta*), Brooklime (*Veronica beccabunga*), Rushes (*Juncus* spp.), Fool's-water-cress (*Apium nodiflorum*), Moss (*Fontinalis* spp.), Yellow Iris (*Iris pseudacorus*) with Hemlock (*Conium maculatum*), Buckler-fern (*Dryopteris* spp.), Water Forget-me-not (*Myosotis scorpoides*), Meadowsweet (*Filipendula ulmaria*) and Willowherb (*Epilobium* spp.) along the banks.

Figure 4.2.6 Depositing/lowland rivers (FW2) (Nov & July)

Drainage Ditches (FW4)

Along the southwest boundary is drainage ditch (FW4) habitat (Baldonnell Upper). The flora found here include are similar to FW1.

Figure 4.2.7 Drainage Ditches (FW4) (Nov & July)

Dry meadows and grassy verges (GS2)

Flora found in dry meadows and grassy verges habitat include Cock's-foot (*Dactylis glomerata*), Nettle (*Urtica dioica*), Hogweed (*Heracleum sphondylium*), Tufted Vetch (*Vicia cracca*), Meadow-grasses (*Poa* spp.), Bent grasses (*Agrostis* spp.), Yorkshire Fog (*Holcus lanatus*), Speedwell (*Veronica* spp.), Rosebay Willowherb (*Chamerion angustifolium*), Ragwort (*Senecio jacobaea*), Hedge Bindweed (*Calystegia sepium*), Nipplewort (*Lapsana communis*), Ribwort Plantain (*Plantago lanceolata*), Weld (*Reseda luteola*), Spear Thistle (*Cirsium vulgare*), Creeping Thistle *(Cirsium arvense*), Greater Plantain (*Plantago major*) and Clover (*Trifolium* spp.).

Figure 4.2.8 Dry meadows and grassy verges (July)

Table 4.1 Habitats found in and along boundary of the development site

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	**LEVEL 2**	**LEVEL 3**
B – Cultivated and built land	**BL** – Built Land	**BL3** – Buildings and artificial surfaces
E – Exposed rock and disturbed ground	**ED** – Disturbed ground	**ED3** – Recolonising bare ground
F – Freshwater	**FW** – Watercourses	**FW2** – Depositing/lowland rivers
		FW4 – Drainage ditches
G – Grassland and marsh	**GA** – Improved grassland	**GA1** – Improved agricultural grassland
		GA2 – Amenity grassland (improved)
	GS – Semi-natural grassland	**GS2** – Dry meadows and grassy verges
W – Woodland and scrub	**WS** – Highly modified/ non-native woodland	**WD2** - Mixed broadleaved/conifer woodland
	WL – Linear woodland / scrub	**WL1** – Hedgerows
		WL2 – Treelines

Table 4.2 Ecological Value of Identified Habitats at the Proposed Development

HABITAT TYPE	HABITAT RATING	KEY ECOLOGICAL RECEPTOR?
Drainage ditch (FW4)	Local importance, lower value	Yes. Modified habitat but would provide habitat for invertebrates.
Depositing/lowland rivers (FW2)	Local importance, higher value	Yes. Important habitat for invertebrates such as White-clawed crayfish and foraging Otter
Mixed broadleaved/conifer woodland (WD2)	Local importance, lower value	Yes. May provide opportunities for bird nesting and foraging for bats.
Hedgerows (WL1)	Local importance, lower value	Yes. May provide opportunities for bird nesting and foraging for bats.
Treelines (WL2)	Local importance, lower value	Yes. May provide opportunities for bird nesting and foraging for bats.
Amenity grassland (improved) (GA2)	Local importance, lower value	No. Modified habitat, low ecological value.
Improved agricultural grassland (GA1)	Local importance, lower value	No. Modified habitat, low ecological value.
Dry meadows and grassy verges (GS2)	Local importance, lower value	No. Modified habitat, low ecological value.
Recolonising bare ground (ED3)	Local importance, lower value	No. Modified habitat, low ecological value.
Buildings and artificial surfaces (BL3)	Local importance, lower value	No. Comprised of artificial surfaces, low ecological value.

Figure 4.3 Habitat Map

4.3 HYDROLOGIC CONNECTIVITY

The proposed development is located within the Liffey and Dublin Bay Catchment (ID 09). Watercourses located near the proposed development are the River Camac (EPA code: 09C02 - Order 4) which joins the River Liffey (EPA code: 09L01 - Order 6), approximately 15km downstream at Sean Heuston Bridge. The River Liffey is tidal at this location. The River Liffey then flows in an easterly direction for a further 7.55km until it flows into Dublin Bay. As the River Liffey flows into Dublin Bay it also flows into the South Dublin Bay and River Tolka Estuary SPA and the South Dublin Bay SAC. The Baldonnell Upper (EPA code: 09B91 - Order 2) flows along the southwest boundary of the site and joins the Camac River at the northwest corner of the proposed site. See Figure 4.4 for watercourses within the vicinity of the site. Protected aquatic habitats and species are summarised in Section 6 below.

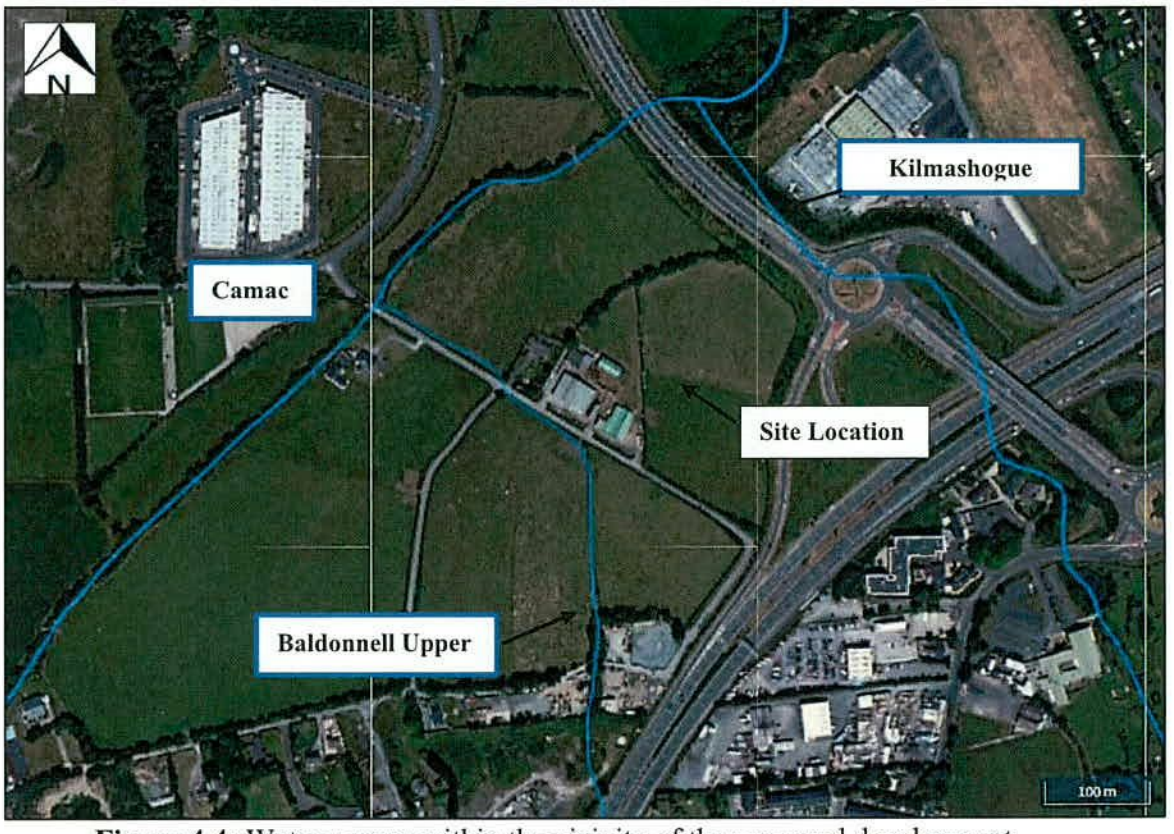

Figure 4.4: Watercourses within the vicinity of the proposed development

The Environmental Protection Agency (EPA) undertake surface water monitoring along the Camac River. The results for the nearest monitoring stations with available information (as per Table 4.2) for the period 1998 – 2019 are summarised in Figure 4.4 below for indicative purposes. As can be seen in Figure 4.4 below, the Camac River is mainly achieving a water quality status of between Q3 (poor) to Q3-4 (moderate) in recent years. Note that station RS09C020500 recorded (2/0) in 2005 and (3/0) in 2010, station RS09C020250 recorded (3/0) in 2007 this indicates a toxic effect is apparent or suspected. EPA comments on the most recent monitoring results for the Camac River are as follows "*The Camac was found to be at unsatisfactory conditions in August 2019. Poor ecological conditions recorded at 0100, 0310 and 0500, with 0100 (Saggart) declining from Good conditions in 2016. Moderate conditions were maintained at 0200 (Brownsbarn).*"

Table 4.2: Monitoring Stations on the River Camac within the vicinity of the development

STATION NO.	STATION LOCATION	EASTING	NORTHING	APPROX. LOCATION RELATIVE TO SITE
RS09C020250	Br SE of Baldonnell Ho	304913	229242	At site boundary
RS09C020310	Riversdale Estate Br	307222	231611	3.68km downstream
RS09C020500	Camac Close Emmet Rd	311965	233446	13km downstream

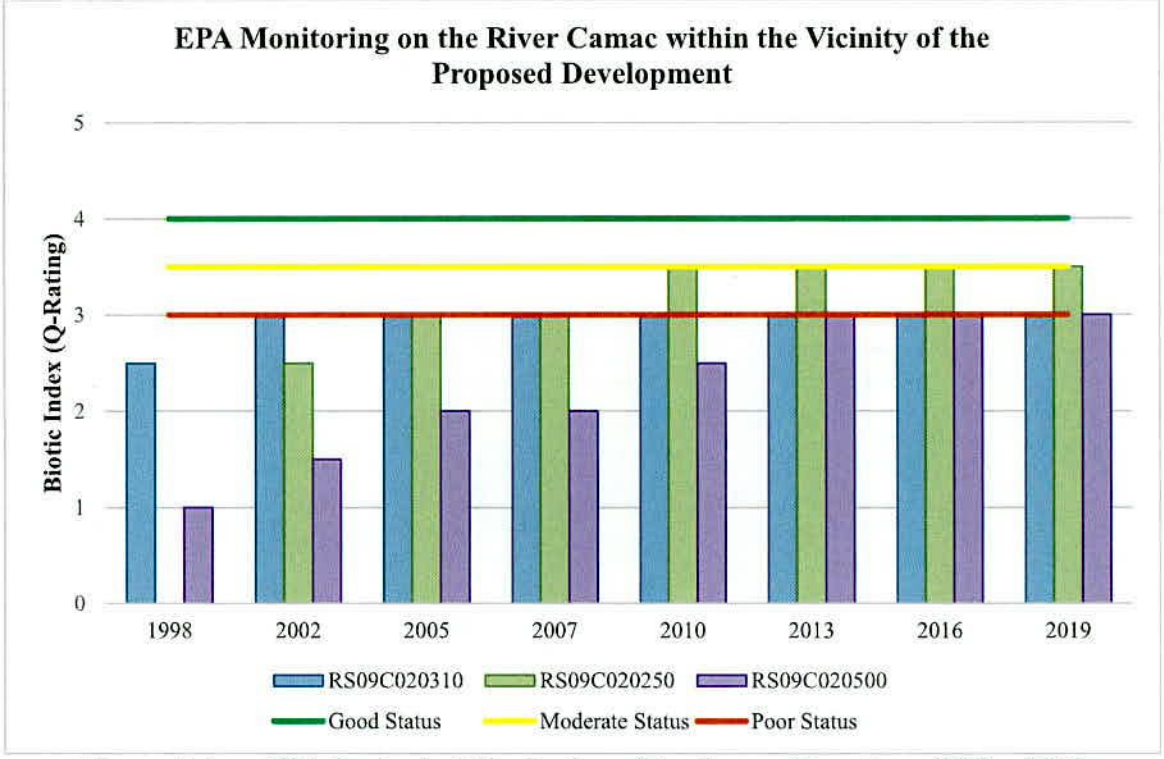

Figure 4.4: EPA Ecological Monitoring of the Camac River from 1998 – 2019

Table 4.3: Status of Transitional and Coastal Waterbodies

TRANSITIONAL AND COASTAL WATERBODIES				
NAME	**ID**	**TYPE**	**STATUS**	**DISTANCE**
Liffey Estuary Lower	IE_EA_090_0300	Transitional	Review - Good	8.5km NE
Tolka Estuary	IE_EA_090_0200	Transitional	At risk - Moderate	14.2km NE
Dublin Bay	IE_EA_090_0000	Coastal	Not at risk - Good	14.5km NE
North Bull Island	IE_EA_090_0100	Transitional	Review - Unassigned	19km NE
Irish Sea Dublin (HA 09)	IE_EA_070_0000	Coastal	Not at risk - Good	21km E
Southwestern Irish Sea - Killiney Bay (HA10)	IE_EA_100_0000	Coastal	Not at risk - Good	22km E

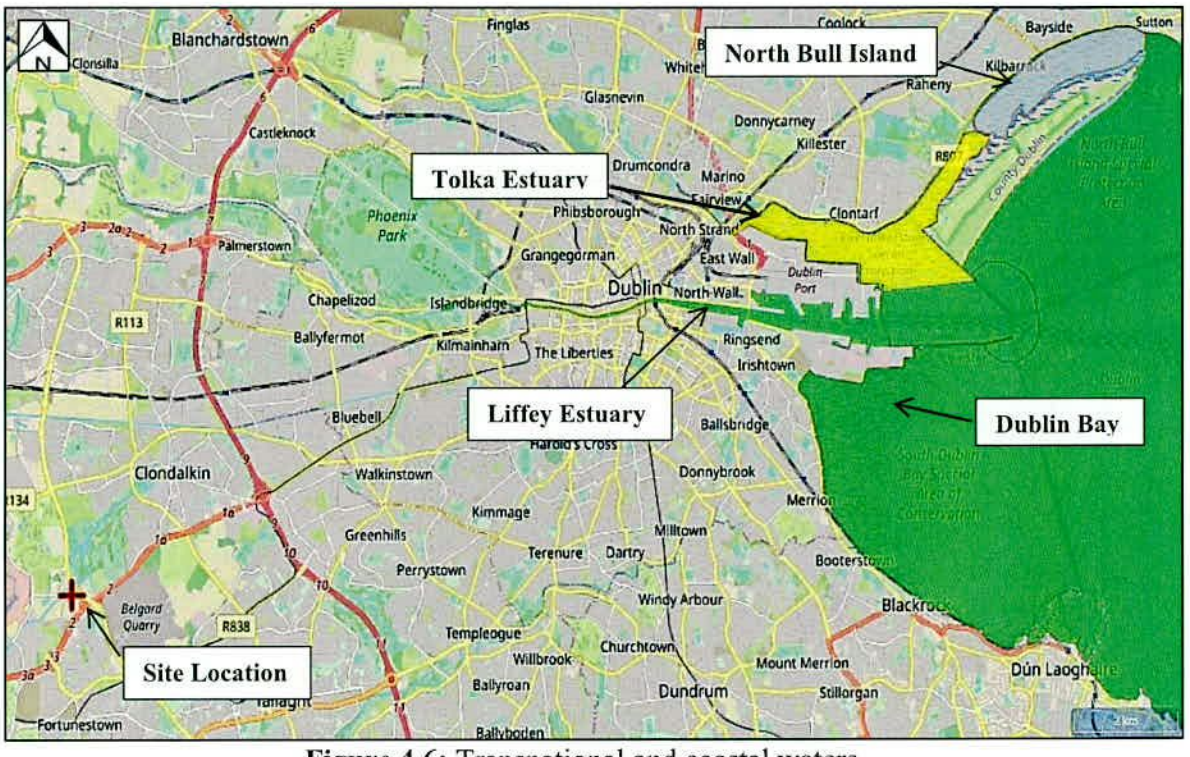

Figure 4.6: Transnational and coastal waters

4.4 INVASIVE SPECIES

Under Regulation 49(2) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to any plant which is included in Part 1 of the Third Schedule shall be guilty of an offence.

Materials containing invasive species such as Japanese Knotweed are considered "controlled waste", and, as such, there are legal restrictions on their handling and disposal. Under Regulation 49(7) of the European Communities (Birds and Natural Habitats) Regulations 2011, it is a legal requirement to obtain a license to move "vector materials" listed in the Third Schedule, Part 3.

During the site assessment no invasive plant species listed in the Third Schedule of the European Communities Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) were recorded. Other invasive species recorded within the site;

Other Invasive Species	Habitat
Sycamore (*Acer pseudoplatanus*)	WL1/WL2
Winter Heliotrope (*Petasites fragrans*)	WL1
Butterfly-bush (*Buddleja davidii*)	WD2

Nine invasive plant species listed in the Third Schedule of the European Communities Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) were recorded within the 10km square;

Third Schedule Invasive Species	Tetrad
Three-cornered Garlic (*Allium triquetrum*)	O02
Rhododendron ponticum	O02
New Zealand Pigmyweed (*Crassula helmsii*)	O02
American Skunk-cabbage (*Lysichiton americanus*)	O02
Curly Waterweed (*Lagarosiphon major*)	O02
Fringed Water-lily (*Nymphoides peltata*)	O02
Giant Hogweed (*Heracleum mantegazzianum*)	O02
Giant Knotweed (*Fallopia sachalinensis*)	O02
Japanese Knotweed (*Fallopia japonica*)	O02

None of these species were found within or adjacent the site boundary. There was no Indian Balsam (*Impatiens glandulifera*) along the Camac River or Baldonnell Upper.

5.0 PROTECTED SPECIES

Developments have the potential to impact upon terrestrial and aquatic biodiversity through destruction and loss of habitat, disturbance due to noise and dust, the potential introduction of invasive species and light pollution.

5.1 BIRDS

Given the urban land use of the surrounding area it would be expected that common garden bird species would be present in the area. Bird species noted during the site assessment are included in the table below;

COMMON NAME	SCIENTIFIC NAME	MONTH OBSERVED	E.U. BIRDS DIRECTIVE	BoCCI* RED LIST	BoCCI* AMBER LIST
Blackbird	*Turdus merula*	Nov & Jul	-	-	-
Blue Tit	*Parus caeruleus*	Nov & Jul	-	-	-
Bull Finch	*Pyrrhula pyrrhula*	Jul	-	-	-
Chaffinch	*Fringilla coelebs*	Nov	-	-	-
Dunnock	*Prunella modularis*	Nov & Jul	-	-	-
Goldfinch	*Carduelis carduelis*	Nov & Jul	-	-	-
Great Tit	*Parus major*	Nov	-	-	-
Greenfinch	*Carduelis chloris*	Nov & Jul	-	-	-
Grey Heron	*Ardea cinerea*	Nov & Jul	-	-	-
Herring Gull	*Larus argentatus*	Nov & Jul	-	✓	-
Hooded Crow	Corvus cornix	Nov & Jul	-	-	-
House Sparrow	*Passer domesticus*	Nov & Jul	-	-	✓
Jackdaw	*Corvus monedula*	Nov & Jul	-	-	-

COMMON NAME	SCIENTIFIC NAME	MONTH OBSERVED	E.U. BIRDS DIRECTIVE	BoCCI* RED LIST	BoCCI* AMBER LIST
Lesser Black-backed Gull	*Larus fuscus*	Nov	-	-	✓
Magpie	*Pica pica*	Nov & Jul	-	-	-
Mallard	*Anas platyrhynchos*	Nov	-	-	✓
Mistle Thrush	*Turdus viscivorus*	Nov & Jul	-	-	-
Moorhen	*Gallinula chloropus*	Nov	-	-	-
Pheasant	*Phasianus colchicus*	Nov & Jul	-	-	-
Pied Wagtail	*Motacilla alba*	Nov & Jul	-	-	-
Robin	*Erithacus rubecula*	Nov	-	-	-
Rook	*Corvus frugilegus*	Nov & Jul	-	-	-
Sparrowhawk	*Accipiter nisus*	Nov	-	-	-
Starling	*Sturnus vulagaris*	Jul	-	-	✓
Swallow	*Hirundo rustica*	Jul	-	-	✓
Woodpigeon	*Columba palumbus*	Nov & Jul	-	-	-
Wren	*Troglodytes troglodytes*	Nov & Jul	-	-	-

**The BoCCI (Birds of Conservation Concern in Ireland) List classifies bird species into one of three lists (Red, Amber or Green) based on their conservation status and conservation priority.*

All of the birds were observed within the grasslands, watercourses and hedgerow/trees of the site. With Lesser Black-backed Gull and Mallard observed flying over the site. Herring Gull is red listed under the BoCCI classification and House Sparrow, Swallow, Starling, Lesser Black-backed Gull and Mallard are amber listed. None of the bird species recorded are listed under Annex I of the E.U. Birds Directive.

Bird records for the previous thirty years were reviewed on the NBDC website for the 10km square in which the proposed development is located. Bird species of note recorded within the O02 tetrad include;

NBDC RECORDS FOR TETRAD O02		
SPECIES	DATASET	DESIGNATION
Barn Owl (*Tyto alba*)	Birds of Ireland	Red List
Barn Swallow (*Hirundo rustica*)	Birds of Ireland	Amber List
Black-headed Gull (*Larus ridibundus*)	Birds of Ireland	Red List
Common Coot (*Fulica atra*)	Birds of Ireland	Amber List
Common Goldeneye (*Bucephala clangula*)	Birds of Ireland	Amber List
Common Kingfisher (*Alcedo atthis*)	Birds of Ireland	Annex I Bird Species
Common Kestrel (*Falco tinnunculus*)	Birds of Ireland	Amber List
Common Linnet (*Carduelis cannabina*)	Birds of Ireland	Amber List
Pochard (*Aythya ferina*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
Common Redshank (*Tringa totanus*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Red List

NBDC RECORDS FOR TETRAD O02		
SPECIES	**DATASET**	**DESIGNATION**
Common Sandpiper (Actitis hypoleucos)	Bird Atlas 2007 - 2011	Amber List
Common Snipe (*Gallinago gallinago*)	Birds of Ireland	Amber List
Common Starling (*Sturnus vulgaris*)	Birds of Ireland	Amber List
Common Swift (*Apus apus*)	Birds of Ireland	Amber List
Eurasian Curlew (*Numenius arquata*)	Birds of Ireland	Red List
Eurasian Teal (*Anas crecca*)	Bird Atlas 2007 - 2011	Amber List
Eurasian Tree Sparrow (*Passer montanus*)	Birds of Ireland	Amber List
Eurasian Wigeon (*Anas penelope*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
Eurasian Woodcock (*Scolopax rusticola*)	Birds of Ireland	Amber List
European Golden Plover (*Pluvialis apricaria*)	Birds of Ireland	Red List
Great Black-backed Gull (*Larus marinus*)	Birds of Ireland	Amber List
Great Cormorant (*Phalacrocorax carbo*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
Great Crested Grebe (*Podiceps cristatus*)	Bird Atlas 2007 - 2011	Amber List
Greylag Goose (*Anser anser*)	Bird Atlas 2007 - 2011	Amber List
Hen Harrier (*Circus cyaneus*)	Birds of Ireland	Amber List
Herring Gull (*Larus argentatus*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
House Martin (*Delichon urbicum*)	Birds of Ireland	Amber List
House Sparrow (*Passer domesticus*)	Birds of Ireland	Amber List
Lesser Black-backed Gull (*Larus fuscus*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
Little Egret (*Egretta garzetta*)	Bird Atlas 2007 - 2011	Annex I Bird Species
Little Grebe (*Tachybaptus ruficollis*)	Bird Atlas 2007 - 2011	Amber List
Mallard (*Anas platyrhynchos*)	Birds of Ireland	Amber List
Merlin (*Falco columbarius*)	Birds of Ireland	Amber List
Mew Gull (*Larus canus*)	Bird Atlas 2007 - 2011	Amber List
Mute Swan (*Cygnus olor*)	Birds of Ireland	Amber List
Northern Goshawk (*Accipiter gentilis*)	Rare birds of Ireland	Amber List
Northern Lapwing (*Vanellus vanellus*)	Birds of Ireland	Red List
Northern Wheatear (*Oenanthe oenanthe*)	Birds of Ireland	Amber List
Peregrine Falcon (*Falco peregrinus*)	Bird Atlas 2007 - 2011	Annex I Bird Species
Red Grouse (*Lagopus lagopus*)	Birds of Ireland	Red List

NBDC RECORDS FOR TETRAD O02		
SPECIES	**DATASET**	**DESIGNATION**
Ringed Plover (*Charadrius hiaticula*)	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Amber List
Rock Pigeon (*Columba livia*)	Ireland's BioBlitz	Annex II Bird Species
Sand Martin (*Riparia riparia*)	Bird Atlas 2007 - 2011	Amber List
Sky Lark (*Alauda arvensis*)	Birds of Ireland	Amber List
Spotted Flycatcher (*Muscicapa striata*)	Birds of Ireland	Amber List
Stock Pigeon (*Columba oenas*)	Bird Atlas 2007 - 2011	Amber List
Tufted Duck (*Aythya fuligula*)	Irish Wetland Birds Survey (I-WeBS) 1994-2001.	Amber List
Whinchat (*Saxicola rubetra*)	Birds of Ireland	Amber List
Yellowhammer (*Emberiza citrinella*)	Birds of Ireland	Red List

The River Camac could offer suitable foraging habitat for Kingfisher (*Alcedo atthis*) however there is no suitable nesting habitat for Kingfisher within the site boundary. No trees or hedgerow will be removed along the banks of the River Camac therefore there will be no significant disturbance to Kingfisher if active along this section of the River Camac.

5.2 BADGER

There are numerous NBDC records for Badger within the Tetrad O02. Animal paths were observed within the proposed site. However, these were attributed to Fox and Rabbit activity. There was no evidence of a badger sett at the site. The treeline and hedgerow habitats would offer suitable foraging habitat for badgers however the site is surrounded by busy roadways to the east and south. The N7 in particular would be a significant hindrance to movement of badgers in the area.

5.3 BATS

See accompanying Bat Assessment Report by VEON Ecology Ltd for a complete assessment of bat activity at the site and detailed survey methodology on monitoring of foraging bats and inspection of trees, hedgerows, buildings and bridges for a potential roost. In summary this bat assessment found the following bats at the proposed development;

BAT SPECIES	ROOSTING	FORAGING	COMMUTING
Leisler's (*Nyctalus leisleri*)	No	Yes	Yes
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	No	Yes	Yes
Common Pipistrelle (*Pipistrellus pipistrellus*)	No	Yes	Yes
Whiskered (*Myotis mystacinus*)	No	Yes	Yes
Daubenton's (*Myotis daubentonii*)	No	Yes	Yes
Nathusius' Pipistrelle (*Pipistrellus nathusii*)	No	Yes	Yes
Natterer's bat (*Myotis nattereri*)	No	Yes	Yes

5.4 OTTER

During the site assessment on the 13th July 2022 evidence of otter (spraints and tracks) was observed along the Camac River. There was no evidence of a holt during either site assessment. Fish and White-clawed Crayfish (*Austropotamobius pallipes*) were observed within the Camac River which are food source for otter. In addition, the NBDC has records of otter within the wider area of the proposed development. Otter would also be found within the River Liffey. The proposed development site is mainly comprised of agricultural/amenity grasslands which can be considered as modified and of lower value to foraging otters.

5.5 INVERTEBRATES

The site survey was done in late November which is not an optimal time to observe invertebrates. Bumblebees (*Bombus*) and Wasps (*Vespidae*) were noted during the site assessment with Midge (*Nematocera*) found near the Camac River. Invertebrate activity was noticeability higher in July as would be expected given the time of year. The site contained flowering plants that was attracting Bumblebees (*Bombus*). Other insects noted during the site assessment were Honeybees (*Apis*), Hover-flies (*Syrphidae*), Wasps (*Vespidae*), Horseflies (*Tabanida*), Midge (*Nematocera*), Ladybird Beetles (*Coccinellidae*), Ants (*Formicidae*), Leafhopper (*Cicadella viridis*) and Lacewing (*Chrysopidae*). With butterfly and moth species found mainly along the grassy verges of the site such as Peacock (*Inachis io*), Small Tortoiseshell (*Aglais urticae*), Meadow Brown (*Maniola jurtina*), Common Blue (*Polyommatus icarus*), Footman (*Eilema* spp.) and The Cinnabar (*Tyria jacobaeae*). Other invertebrates noted were Spiders (*Arachnids*). The hedgerows, treelines, watercourses and grasslands would provide suitable habitat for invertebrates.

The Camac River and Baldonnell Upper watercourse would offer suitable habitat for invertebrates but not for protected invertebrates such as Whorl Snail (*Vertigo* sp.). The site does not contain any habitat suitable for Marsh Fritillary (*Euphydryas aurinia*). The Camac River is noted as containing White-clawed Crayfish (*Austropotamobius pallipes*), this species was observed within this river during the assessment of the riverbed and vegetation in both November and July.

Invertebrates' records for the previous thirty years were reviewed on the NBDC website for the 10km square in which the proposed development is located. Invertebrates' species of note recorded within the O02 tetrad include;

SPECIES	SPECIES NAME	DATASET	DESIGNATION
Butterfly	Small Heath (*Coenonympha pamphilus*)	Irish Butterfly Monitoring Scheme	Near threatened
Bee	Andrena (Andrena) fucata	Bees of Ireland	Near threatened
Bee	Andrena (Oreomelissa) coitana	Bees of Ireland	Vulnerable
Bee	Bombus (Bombus) cryptarum	Bees of Ireland	Data deficient
Bee	Bombus (Bombus) magnus	Bees of Ireland	Data deficient
Bee	Gipsy Cuckoo Bee (*Bombus (Psithyrus) bohemicus*)	Bees of Ireland	Near threatened

SPECIES	SPECIES NAME	DATASET	DESIGNATION
Bee	Gooden's Nomad Bee (*Nomada goodeniana*)	Bees of Ireland	Endangered
Bee	Large Red-Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius*)	Bees of Ireland	Near threatened
Bee	Lasioglossum (Dialictus) smeathmanellum	Bees of Ireland	Data deficient
Bee	Megachile (Delomegachile) willughbiella	Bees of Ireland	Near threatened
Bee	Megachile (Megachile) centuncularis	Bees of Ireland	Near threatened
Bee	Moss Carder-bee (*Bombus (Thoracombus) muscorum*)	Bees of Ireland	Near threatened
Bee	Nomada striata	Bees of Ireland	Endangered
Beetle (*Coleoptera*)	Macroplea appendiculata	Water Beetles of Ireland	Near threatened

5.6 AMPHIBIANS AND REPTILES

The Camac River and Baldonnell Upper watercourse located along the development site boundary would be considered suitable habitat for amphibians such as the Common Frog (*Rana temporaria*). No Lizards were noted during the site assessment with no areas of exposed concrete/rock that would offer suitable sunbathing areas. The mature hedgerows could act as suitable terrestrial habitat and migration corridors for both amphibians and reptiles. NBDC records for the 10km tetrad O02P include the protected species Common Frog (*Rana temporaria*), Smooth Newt (*Lissotriton vulgaris*) and Common Lizard (*Zootoca vivipara*) but no amphibian or reptile are recorded within the 2km tetrad O02.

5.7 OTHER SPECIES

The overall site consists of mainly grasslands with hedgerows and treelines along the field boundaries. Given the urban setting and busy roadways (N7/L1021) it is very unlikely that large mammals such as Deer would be found within the site. It is possible that Irish hare (*Lepus timidus hibernicus*) could utilise the site as Rabbit (*Oryctalagus cuniculus*) activity was noted at the site (both burrows and faeces). Fox (*Vulpes vulpes*) was also noted as active within the site with a den found along the hedgerow to the north and faeces found along the Camac River. Fox was noted as absent from the site in July. Fish (likely to be Trout) were observed in the Camac River with smaller fish observed in the Baldonnell Upper.

Other fauna not observed but would be typically found throughout the rest of Ireland would be present in the area of the proposed development. These include Hedgehog (*Erinus europaeus*), Stoat (*Mustela erminea hibernica*) and Wood Mouse (*Apodemus sylvaticus*). Fauna records for the previous thirty years were reviewed on the NBDC website for the tetrad O02 include the following; Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Pine Marten (*Martes martes*), Red Deer (*Cervus elaphus*) and Hedgehog (*Erinaceus europaeus*).

Invasive Fauna of note include; American Mink (*Mustela vison*), Brown Rat (*Rattus norvegicus*), Eastern Grey Squirrel (*Sciurus carolinensis*), Rabbit (*Oryctolagus cuniculus*), Greater White-toothed Shrew (*Crocidura russula*), Sika Deer (*Cervus nippon*), Fallow Deer (*Dama dama*) and House Mouse (*Mus musculus*).

Table 5.6: Ecological Value of Species of the Proposed Development

SPECIES	SPECIES RATING	RATIONALE
Badger	Local importance, low to high value	Yes. The treeline and hedgerow would provide both shelter and foraging resource for badgers. Given the proximity of Corkagh Park it is likely badger would forage along the Camac River. Badger activity would be limited by the proximity of the N7 and wider urban area.
Bats (foraging and commuting habitat only – no bat roosts identified)	Local importance, higher value	Yes. The hedgerows / treelines within and adjacent to the proposed development are utilised by bats for both foraging and commuting.
Otter	Local importance, higher value	Yes. The Camac River within the site is limited in volume but otter would utilise for foraging for prey such as crayfish, fish and frogs.
Other	Local importance, low to high value	Yes. Evidence of other mammals at the site include Rabbit and Fox. Site has some potential to support other mammal species such as Hedgehog.
Breeding Birds	Local importance, higher value	Yes. All birds, their nests, eggs and young are protected under the Wildlife Act.
Aquatic Fauna	Local importance, higher value	Yes. The Camac River has White-clawed crayfish within it. The river supports fish.

6.0 PROTECTED SITES

6.1 NATURA 2000 SITES WITHIN ZONE OF INFLUENCE

In assessing the zone of influence of this project upon European sites, the following factors must be considered:

- Potential impacts arising from the project;
- The location and nature of European sites;
- Pathways between the development and European sites.

The project impact sources, environmental pathways and protected site characteristics were screened to identify European sites potentially within the zone of influence of the project.

Three Special Protection Area (SPA) sites occur within 15km of the proposed development and five Special Area of Conservation (SAC) sites occur within 15km of the proposed development and are shown in the following table:

SITE NAME	DESIGNATION	SITE CODE	DISTANCE
Glenasmole Valley	SAC	001209	6.1km SE
Wicklow Mountains	SAC	002122	7.6km SE
Rye Water Valley/Carton	SAC	001398	8km NW
Wicklow Mountains	SPA	004040	10.6km SE
Red Bog	SAC	000397	13.9km SW
Poulaphouca Reservoir	SPA	004063	14km SW
South Dublin Bay and River Tolka Estuary	SPA	004024	14.5km NE
South Dublin Bay	SAC	000210	14.5km NE

See Appendix A for maps of the Natura 2000 sites within 2km and 15km of the proposed development site. The main source-pathway this site has with any of the sites listed above is hydrological due to the Camac River flowing along the field boundary. The only protected sites hydrologically connected to the proposed site are South Dublin Bay SAC (Site code: 000210) and South Dublin Bay and River Tolka Estuary (Site code: 004024). However, given the hydrological distance the dilution effect of Dublin Bay/Irish Sea and that no construction works will take place within a watercourse the potential impact on both SAC and SPA would not be significant.

The proposed site would not have any significant impact on the other sites listed above as the site does not contain any protected species or habitat of conservation value. In absence of a source pathway there would be no significant impact on the Natura 2000 Network.

6.2 OTHER PROTECTED SITES WITHIN ZONE OF INFLUENCE

No National Heritage Area occurs within 15km of the proposed development. Eleven proposed National Heritage Areas (pNHA) occur within approximately 15km of the proposed development.

SITE NAME	DESIGNATION	SITE CODE	APPROX. DISTANCE
Grand Canal	pNHA	002104	3km N
Lugmore Glen	pNHA	001212	3.7km SE
Slade Of Saggart And Crooksling Glen	pNHA	000211	4.6km SW
Dodder Valley	pNHA	000991	5.4km SE
Glenasmole Valley	pNHA	001209	6.1km SE
Liffey Valley	pNHA	000128	6.4km NW
Royal Canal	pNHA	002103	8km NW
Kilteel Wood	pNHA	001394	10.3km SW
Fitzsimon's Wood	pNHA	001753	13km SE
Red Bog	pNHA	000397	13.7km SW
South Dublin Bay	pNHA	000210	14.5km NE

See Appendix A for maps of the pNHAs within 2km and 15km of the proposed development site.

The main source-pathway this site has with any of the sites listed above is hydrological due to the Camac River flowing along the field boundary. The only protected sites hydrologically connected to the proposed site are South Dublin Bay pNHA (Site code: 000210) and Dolphins, Dublin Docks pNHA (Site code: 000201) which are connected via the Rivers Camac and Liffey. Water quality could have an impact on these sites however the proposed surface drainage system and waste water drainage connection to be installed at the site will prevent a significant impact on the water quality of these sites. The proposed site would not have any significant impact on the other sites listed about as the site does not contain any protected species or habitat of conservation value nor is there a direct hydrological link between the sites.

7.0 ECOLOGICAL IMPACT ASSESSMENT

The construction phase of the development would result in a change of grassland from agricultural to amenity. The fields to the northwest and southeast are currently being left to go fallow with recolonising plants typically found in agricultural land becoming more frequent. As can be seen in remote imagery this grassland was previously used for livestock grazing. The majority of the flora found here are recolonising species, as such the area would be considered as having been modified and of low ecological value.

Sections of hedgerows will be removed however additional hedgerows will be planted with native species. The majority of the mature trees within the site are Ash (*Fraxinus excelsior*) that may become susceptible to Ash Dieback (*Hymenoscyphus fraxineus*) that is currently spreading through Ireland. As per the Arborist Assessment some of the Ash within the site are succumbing to this disease. Elm (*Ulmus* sp.) within the hedgerow is already dead or dying due to Dutch Elm Disease (*Ophiostoma novo-ulmi*), this pathogen is established in Ireland and prevents the majority of native and introduced Elms from reaching maturity. Any new native trees planted within the site should come from disease resistant breeds. No hedgerow will be removed along the Camac River. The loss of hedgerow habitat within the site will be offset by planting new hedgerows with native species. The sections of hedgerow/treeline that require removal would not be undertaken during the 1st of March to the 31st of August, so as not to disturb nesting bird species. This habitat would offer suitable breeding areas for birds and its removal should be undertaken outside the bird nesting season. The landscape plan includes native tree species in its design such as Birch (*Betula* spp.), Yew (*Taxus baccata*), Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), Crab Apple (*Malus sylvestris*), Holly (*Ilex aquifolium*), Rowan (*Sorbus aucuparia*) and Hazel (*Corylus avellana*). Other trees species to include naturalised species such as Beech (*Fagus sylvatica*).

The final site design will include a buffer zone along the Camac River (minimum 10m) and along the Baldonnell Upper. Additional flora along the Camac River to be native tree species and allowing the bank to naturalise. The riparian zone of the Camac River was previously very narrow with little setback from the agricultural field. The inclusion of the riparian zone will allow for increased biodiversity that will significantly increase invertebrate activity along the banks. Increased vegetation of the banks will provide cover for foraging fauna such as otter.

Wildflower meadows will be included with flora such as Bird's-foot-trefoil (*Lotus corniculatus*), Red Clover (*Trifolium pratense*), Devil's-bit Scabious (*Succisa pratensis*), Field Scabious (*Knautia arvensis*), Common Knapweed (*Centaurea nigra*), Lady's Bedstraw (*Galium verum*), Ox-eye Daisy (*Leucanthemum vulgare*), Meadowsweet (*Filipendula ulmaria*), Ragged robin (*Lychnis Flos-cuculi*), Selfheal (*Prunella vulgaris*), Purple-loosestrife (*Lythrum salicaria*) and Vetch (*Vicia* spp.).

Dust emissions may arise during construction activities, in particular during earth-moving works, which may have the potential to impact upon photosynthesis, respiration and transpiration processes of flora due to the blocking of leaf stomata and have the potential to cause nuisance to fauna. Given the transient nature of construction works the potential impact to flora and fauna would not be considered significant when appropriate measures are taken to protect the environment during the construction phase.

7.1 TERRESTRIAL BIODIVERSITY PROTECTION PROTOCOL

As a matter of standard construction practice, the development would be constructed in accordance with the following methods and guidelines:

- All construction works would be confined as far as possible to the development footprint;
- Where possible, no construction works would be conducted outside of normal working hours, to reduce potential noise disturbance to nocturnal species;
- Should a protected fauna species such as bat species, badger or hedgehog be found during the construction phase of the project, an officer of the NPWS would be notified prior to the resumption of construction works;
- Where possible, vegetation removal works would be scheduled outside of the 1st of March to the 31st of August period, so as not to disturb nesting bird species;
- If works should take place beside any trees that will remain as part of the landscape plan, then a root protection would be maintained throughout the construction phase;
- See accompanying Arboricultural Assessment for details on Root Protection Area methodology.
- The construction works contractor would take cognisance of the NRA's document "*Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes*", 2006. In particular, the construction works contractor would take cognisance of the guidelines with regards soakaway, waste water drainage and the determination of the root protection area of the existing trees to be retained along the boundary of the proposed site;
- A Landscape Plan will be prepared as part of the development and will take into consideration the wider environment and the dominant use of native species;
- All hedgerows will be replanted with native hedgerow species;
- All planting of trees and hedges to be undertaken during bare root season November to April. The balance of tree planting and lawn seeding to be completed within 12 months of the completion of construction work of the development.

7.2 DISTURBANCE TO PROTECTED HABITATS AND SPECIES

The proposed development does not directly impinge on any part of a protected site, and as such would not be expected to have any in-situ effects upon a protected site through loss or destruction of habitat, fragmentation of habitat, disturbance of habitat or direct reduction in species density.

7.2.1 Badger

No badger setts were recorded during the ecological survey or within the zone of influence of significant disturbance of the proposed development.

If a badger sett is discovered during site clearance works, then this would have a negative impact on badger therefore mitigation measures should be put in place under licence having regard for Guidelines for the Treatment of Badgers Prior to the Construction of National Road

Schemes (NRA 2006). The building site should be made safe for mammals with hazards such as open holes/excavations covered over or fitted with ramps to allow for escape. Guidelines on both active and inactive sets must be followed:

"The destruction of a successfully evacuated badger sett may only be conducted under the supervision of qualified and experienced personnel under licence from the NPWS. The possibility of badgers remaining within a sett must always be considered; suitable equipment should be available on hand to deal with badgers within the sett or any badgers injured during sett destruction"

7.2.2 Bats

See accompanying Bat Assessment Report by VEON Ecology Ltd for a complete assessment of disturbance to bats and proposed mitigation measures to prevent a significant impact on local bat populations. As per the Bat Assessment Report if all proposed measures are put in place, then impact on bat populations will be of minor significance.

It is an offence under Section 23 of the Wildlife Act and under Section 51 of Habitat Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the Habitat Regulations, 2011 actions that intentionally or unintentionally harm, damage or destroy a bat or its roosting site are considered to be an offence. According to Section 54(2) of the Habitats Regulations 2011, a derogation licence to disturb bats or the breeding or resting places may be granted 'where there is no satisfactory alternative, and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range'.

Furthermore, as a signatory to the EUROBATS Agreement (Agreement on the Conservation of Populations of European Bats, 1994), Ireland is required to protect their habitats and important feeding areas from damage or disturbance. All Irish bat species are listed in Appendix II of the Bern Convention (1979), as species requiring protection.

Artificial lighting during the construction and operational phases has the potential to negatively impact upon bat species, as illumination can impact upon their roosting sites, commuting routes and foraging areas. During the construction phase, works are not anticipated to be conducted outside of normal working hours, which would considerably reduce the potential impacts upon bat species. Should lighting be required during construction, measures are included below to reduce the potential impact of light pollution. Operational phase impacts on bats would be associated with permanent lighting associated with the new proposed development, including the carpark, clubhouse and amenity areas. Flood lighting of sport pitches would mainly be used during the winter months during the normal operational hours of the club. It is not anticipated that this lighting would be in use late at night as all training will typically run from 7:30pm – 9:30pm (Tuesday – Thursday). Competitive matches are typically played during the day at weekends and only occasionally midweek. In the absence of mitigation measures, operational lighting has the potential to result in a moderate to adverse impact upon bat species. Therefore, measures with regards artificial lighting, as outlined below would be recommended to be implemented.

White light emitting diode (LED) would be used where possible, which is considered to be low impact in comparison to other lighting types. LED luminaires are highly directional, lower intensity, good colour rendition and dimming capability. A warm white spectrum (<2700

Kelvins should be used as this will reduce the blue spectrum. Luminaires should have peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.

Artificial Lighting during construction phase;

- Construction works in the hours of darkness, when bats are active (April – October), would be kept to a minimum;
- Lighting of hedgerows / treelines would be avoided where possible;
- Direct lighting of the Camac River to be avoided;
- Should lighting be required during construction works, it would be of a low height (without compromising safe working conditions) to ensure minimal light spill. Where possible and where practicable to do so, timers or motion sensors would be used;
- Directional lighting would be used where possible, by use of louvres or shields fitted to the lighting;

White light emitting diode (LED) would be used where possible, which is considered to be low impact in comparison to other lighting types.

Artificial Lighting during operational phase;

See accompanying lighting assessment and design by Wink (Report Ref: 22112 - Clondalkin RFC). The lighting design would take cognisance of the following mitigation measures:

- Lighting would be directed to where it is required only;
- Lighting of hedgerows / treelines would be avoided where possible;
- Buildings, carparks and site entrance lighting would be angled away from hedgerows and treelines;
- Direct lighting of the Camac River to be avoided;
- Lighting would be of low height where possible, to minimise light spill;
- Where possible and practicable to do so, timers or motion sensors would be used;
- White LED or amber coloured LED outdoor lighting would be used where possible, which is considered to be low impact in comparison to other lighting types.

7.2.3 Otter

Otter requires safe refuges from disturbance from human activities. As per the NRA guidelines (2008) on treatment of otters during construction no works should be undertaken within 150m of any holts at which breeding females or cubs are present. Otter is unlikely to be breeding along this stretch of Camac River. Only upon consultation with the NPWS works can take place closer to a holt provided mitigation measures are put in place such as screening, otter proof fencing and restricting working hours on site. There will be major construction works along the Camac River or adjacent to it. Limiting construction activities to times when otter is not foraging will limit disturbance to this species. During the operational phase the Camac River must not be lit up or have flood lighting impacting on it. The riparian zone should be

managed for biodiversity with no recreational activities to take place within this zone. At the bridging point, light sensors should be included to allow only illumination when the cycle path is in use. This cycle path should not be lit up through the night but only when the club is operational. See accompanying lighting assessment and design by Wink (Report Ref: 22112 - Clondalkin RFC).

Stormwater from the proposed development would comprise of clean rainwater run-off from roof and paved areas and would be directed to the drainage network and attenuation system within the proposed development. The sanitary service drainage system will be discharged to municipal sewer via a proposed new connection. Therefore, there would no impact on water quality that could cause a potential impact on aquatic fauna such as fish and crayfish that otter or waterfowl or Kingfisher (Annex I of the E.U. Birds Directive) would prey upon. Sports activities within proximity to the Camac River will cease at 9.30pm. Otter are nocturnal animals and therefore any activity at the proposed site would not significantly impact on foraging otter that utilise this section of the Camac River. The change of use from agricultural to amenity grassland will not impact on foraging otter.

7.3 INVASIVE SPECIES

The following controls for the prevention / treatment of invasive flora species would be implemented throughout the construction phase of the development:

- Regular site inspections would be undertaken to ensure that no growth of invasive species has taken place;
- The construction works contractor would ensure that all equipment and plant is inspected for the presence of invasive species and thoroughly washed prior to arriving to, and leaving from, the development site;
- All relevant construction personnel would be trained in invasive flora species (main species of concern) identification and control measures;
- In the unlikely event of an invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 appearing onsite, works within the immediate vicinity would cease until the invasive plant has been appropriately treated and disposed of to a suitably licenced facility, in accordance with Regulation 49 of the 2011 Regulations;
- During the operational phase the grounds keeper would monitor the site for any potential invasive species and put in a management plan to control the spread of any invasive flora that are introduced to the site;
- Cognisance would be taken of the National Roads Authority's Guidelines on "*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*".
- Care should be taken if using herbicides beside a watercourse as this can have an impact on aquatic flora and fauna and can travel downstream of the site. Herbicide application should only be carried out by suitably qualified contractors or operators with strict

reference to the product label, local land use, health and safety considerations and any pertinent regulations;

- All herbicide treatment must comply with the pesticide regulations S.I. No. 155/2012 - European Communities (Sustainable Use of Pesticides) Regulations 2012 or any amended or current regulations at the time of use.

7.4 AQUATIC ECOLOGY

The following mitigation measures would be proposed to ensure there is no significant impact upon the aquatic ecology of the area owing to a deterioration in water quality:

- The construction works contractor would adhere to standard construction best practice, taking cognisance of the Construction Industry Research and Information Association (CIRIA) guidelines "Control of Water Pollution from Construction Sites; guidance for consultants and contractors" 2001 and "Control of Water Pollution from Construction Sites – Guide to Good Practice", 2002;
- Any vegetation cuttings along the Camac River and Baldonnell Upper watercourse should be removed from the watercourse and stored away from the banks;
- The riparian zone along the Camac River should be maintained to increase biodiversity with a suitable buffer zone of minimum 10m;
- No fertilizer should be used within or in close proximity to the Camac River riparian zone;
- Grass clippings should not be stored in proximity to the any watercourse or manhole to prevent organic matter entering a watercourse;
- Construction activities such as earth moving shall be avoided during or after prolonged rainfall or an intense rainfall event and work will cease entirely if it is evident that water quality is being impacted within the unnamed watercourse;
- Daily visual inspections would be undertaken of the Camac River and Baldonnell Upper watercourse within the site during construction works;
- Should water be encountered during excavation works at the site, water would be pumped to a silt control feature, such as an appropriately sized tank / tanker and used for settlement;
- This settlement tank must have adequate capacity and water must be filtered before discharging. Water must not be directly discharged to a watercourse;
- Excavations and earth-moving activities would be planned outside periods of heavy rainfall, to limit the potential for suspended solids to become entrained within surface water run-off;
- Silt fencing would be placed around spoil areas until such time as the excavated soil has been used in landscaping / re-instatement works;
- Silt fencing to be placed along the footbridge and banks of Camac River throughout the construction of the cycle path;
- Silt fencing to be placed along the bank of the Baldonnell Upper and Camac River during installation of flood lights;

- Where possible, surface water run-off would be diverted from areas of bare / exposed ground;
- The use of pre-cast concrete where possible, the delivery and pouring of concrete would be supervised;
- All plant machinery and equipment would be maintained in good working order and regularly inspected;
- The re-fuelling of machinery would not take place within the immediate vicinity of drainage network;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be available onsite;
- In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material would be properly disposed of to an authorised waste contractor;
- Cognisance should be taken of Inland Fisheries Ireland's "*Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*";

7.4.1 Horizontal Directional Drilling (HDD)

The foul water drainage system will be discharged to the public sewer entering the site across the north-western site boundary. The river crossing will be achieved by using the directional drilling method (HDD) with minimum of 500mm clearance below the river bed level in accordance with Irish Water's standard details.

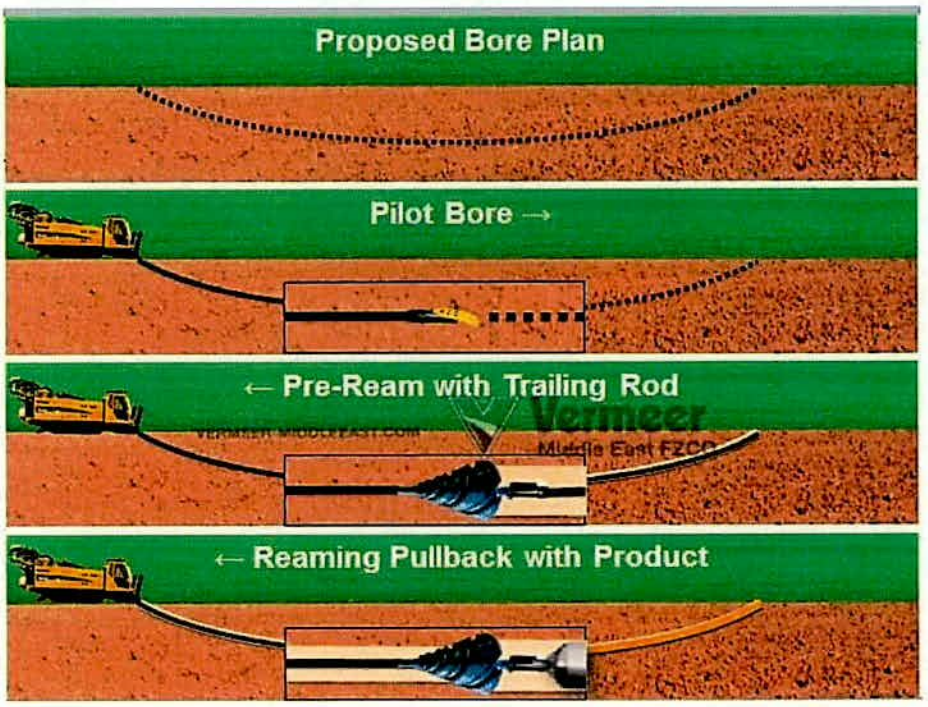

Figure 7.1: Horizontal Directional Drilling (HDD) Method

Horizontal Directional Drilling or HDD, is a steerable trenchless method of installing an underground pipe in a shallow arc along a prescribed bore path by using a surface-launched

drilling rig, with minimal impact on the surrounding area. It is used as an alternative option to open-cut trenching subject to the ground conditions being suitable.

HDD method does not require long linear excavations to install the pipe. The pipe is installed from a small excavation, known as the launch pit and drilled through the subsurface to a receptor pit using a drill rig. Once the bore is formed, a reaming tool is fitted to the end of the bore rod (at the opposite end to the rig) where the pipeline that is being installed is then attached to the end of the reaming tool where the rig then pulls the bore rod back while the reaming tool is forming a larger conduit for the pipeline to fit into.

These proposed works, including the installation of precast manhole chambers, would occur within approximately 5 metres of the Camac River boundary.

HDD operates from discrete working areas at each end of the run where containment and other environmental responsive procedures can be properly established, monitored and maintained.

Drilling fluid is used to lubricate the drill-head rods and used to keep the borehole open and to transport cuttings back to the launch pit. Top-soils and subsoils from the bore route would also be deposited to either end of the bore path.

The following mitigation measures should be followed for proposed HDD works:

- Appropriate silt fencing would be placed between the working areas and the Camac River prior to any works commencing,
- Silt fencing to remain in place until all drilling, installation and reinstatement works are completed (including precast manhole chambers),
- Excavations would be planned outside periods of heavy rainfall, to limit the potential for suspended solids to become entrained within surface water run-off;
- Silt fencing would be placed around spoil areas until such time as the excavated soil has been used in landscaping / re-instatement works;
- If project phasing permits, spoil should be transported to a primary stockpile area for landscaping works,
- Ensure all drilling equipment is in good well maintained,
- HDD drilling should be supervised by an appropriately qualified expert throughout drilling activities,
- Maintain good drill fluid rheology with careful monitoring of the drill cuttings and position of the drill head,
- All stored lubricant should be appropriately bunded and not stored within 10 meters of the drainage network,
- Spill kits, adequately stocked with spill clean-up materials, would be available within the working area;

Assuming all mitigation measures are put in place, there would be no significant residual impacts to the aquatic environment from the proposed development.

8.0 CUMULATIVE IMPACTS

The residual impact of this proposed development is anticipated to be slight negative local effect. Cumulative effects from a development in general can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018).

Considering the nature of the development and the adjacent urban and industrial areas further to the northwest, the main potential cumulative impact upon biodiversity would be a deterioration in water and air quality during the operational phase resulting in an impact upon aquatic flora and fauna species and / or loss or fragmentation of natural habitat.

It is not anticipated that there would be any significant impact upon water quality during the operational phase, given that stormwater from the site would be directed to the drainage network and attenuation system and percolate to ground within the site. The surface water drainage will be attenuated in line with the recommended guidelines and policy. The sanitary service drainage system will be discharged to municipal sewer via a proposed new connection.

With regards potential habitat loss or fragmentation of habitat, the proposed development is not anticipated to result in a significant impact upon habitat loss / fragmentation during either the construction or operational phases, given that the majority of the land would comprise of modified habitats of low ecological value and given that the landscape plan for the development will take into consideration the setting and use of native species. Any hedgerows removed will offset by planting new hedgerows with native species typically found in hedgerows in the local area. No construction works will take place within the Camac River or Baldonnell Upper watercourse. Therefore, there would be no cumulative habitat loss or fragmentation impacts which could pose a significant risk to biodiversity.

Potential cumulative lighting impacts from external lighting for both developments have been addressed in the mitigation measures proposed in Section 7.2.2, accompanying lighting assessment and bat assessment report for this development, therefore cumulative impacts as a result of external lighting should not arise.

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	MITIGATION MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
Habitat Loss	Construction & Operational	Slight significance	• Excavated soils would be segregated into subsoil and topsoil and reused in reinstatement and landscaping works; • The landscaping plan for the development take into consideration the setting and use of native species.	Not significant	Neutral
Introduction of Invasive Flora Species	Construction & Operational	Slight significance	• Construction plant would be inspected and washed prior to arriving onsite; • Regular site inspections for the presence of invasive species would be undertaken; • Should invasive species appear onsite, works would immediately cease until the plant was appropriately treated and disposed of. • Grounds keeper will ensure site remains free of high impact invasive species.	Not significant	Neutral
Fauna Disturbance	Construction	Moderate significance	• Where possible, no construction works would be conducted outside of normal working hours • All plant machinery and equipment would be maintained in good working order and regularly inspected • Where possible, vehicles would be equipped with mufflers to suppress noise • As a minimum, the construction work contractor would comply with all legislative provisions relating to scrub / tree removal • Should a protected fauna species be found during the construction phase, the NPWS would be notified prior to the resumption of construction works.	Slight significance	Minor Negative

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	MITIGATION MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
			• Works should not take place beside a Badger Sett and guidelines by NRA followed. • See Section 7 for detailed environmental control measures during the construction phase.		
	Operational	Not significant	None required	Not significant	Neutral
Fauna Mortality	Construction	Moderate significance	• As a minimum, the construction work contractor would comply with all legislative provisions relating to hedgerow / tree removal • Where scrub and hedgerow / tree removal works that are required during the bird nesting season (1st March to 31st August), the sections of scrub and trees for removal would be inspected by an ecologist for the presence of breeding birds. Where nests are present, a decision would be made as to whether a licence is required from the NPWS, or whether a suitable buffer zone could be established around the active nest with removal works rescheduled until chicks have fledged. • If any Badgers, Hedgehogs or other protected fauna are found on site, the NPWS will be contacted. • In addition, review the Irish Wildlife Trust for links on appropriate fauna relocation services.	Slight significance	Minor Negative
Bats – Disturbance / Severance of Habitat	Construction	Slight significance	• Landscape plan would take into consideration the replacement hedgerows and steps to enhance the new hedgerows with suitable planting if required; • Measures would be implemented to reduce the potential for light pollution;	Not significant	Neutral

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	MITIGATION MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
			• Construction works in the hours of darkness would be kept to a minimum where possible		
	Operational	Slight significance	• Lighting design measures would be implemented to reduce the potential for upward light pollution; • Direct lighting of the Camac River to be avoided. • Sensor lights to utilised to limit light spill.	Slight significance	Minor
Surface Water Quality Deterioration	Construction	Moderate significance	• Standard construction control measures for the protection of surface waters would be implemented; • Concrete works would be supervised; • Appropriate storage and handling of fuels and oils; • Provision of spill kits; • Additional controls for HDD works in the vicinity of Camac River.	Not significant	Neutral
	Operational	Moderate significance	• No herbicides to sprayed within proximity to the Camac River and Baldonnell Upper watercourse; • Grass clippings should not be stored in proximity to a watercourse	Not significant	Neutral
Designated Sites	Construction	Moderate significance	• Standard construction control measures for the protection of surface waters would be implemented • Concrete works would be supervised • Appropriate storage and handling of fuels and oils • Provision of spill kits	Not significant	Neutral
	Operational	Not significant	None required	Not significant	Neutral

8.1 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered in compiling any specific information regarding biodiversity.

8.2 "DO NOTHING" SCENARIO

The footprint of the proposed development is mainly comprised of habitats which are modified and of low ecological value. The majority of the site is amenity and agricultural grasslands with common grass species and recolonising flora. It is likely if this development did not proceed the site would return to agricultural use. As the site is located along a busy national road and surrounded by urban development it is likely that this site will be developed for commercial use in the future. The hedgerows and treelines would need to be maintained with the dead Elm and any Ash that succumbs to Ash dieback likely to be removed. The Camac River would remain unaltered with the main potential impact on water quality to be from urban and industrial developments in the wider area. It is likely otter would still forage along this watercourse provided water quality does not go below a Q3-4 (moderate status) as White-clawed Crayfish are sensitive to pollution below this point.

9.0 CONCLUSIONS

It is the conclusion of this report that there would be no potential for any significant impact on protected species as a result of the proposed development. With full and proper implementation of bat protection measures and lighting during operational and construction phase, the proposed development will have a reduced impact on local bat populations. Measures put in place for the protection of flora such as tree root protection and fauna by protecting water quality will ensure there are no potential for significant effects, and the project is recommended to proceed as proposed. The inclusion of a riparian zone along Camac River will increase the ecological value of the river bank.

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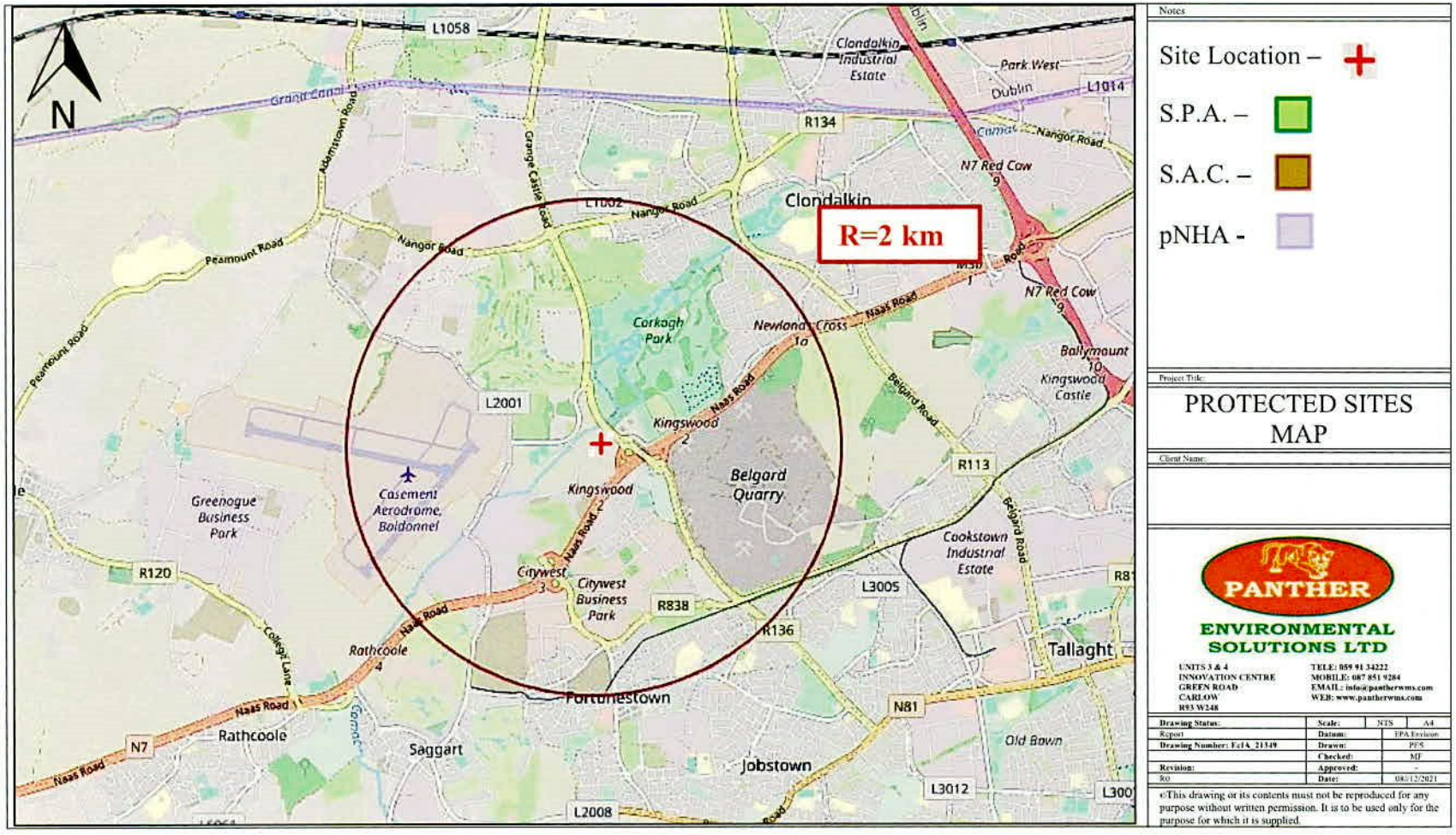
APPENDIX A
PROTECTED SITES AND PROPOSED SITE LAYOUT



Notes

Site Location –

S.P.A. –

S.A.C. –

pNHA -

Project Title:

PROTECTED SITES MAP

Client Name:

PANTHER
ENVIRONMENTAL SOLUTIONS LTD
UNITS 3 & 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248
TELE: 059 91 34222
MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

Drawing Status:	Scale:	NTS	A4
Report	Datum:		EPA Envision
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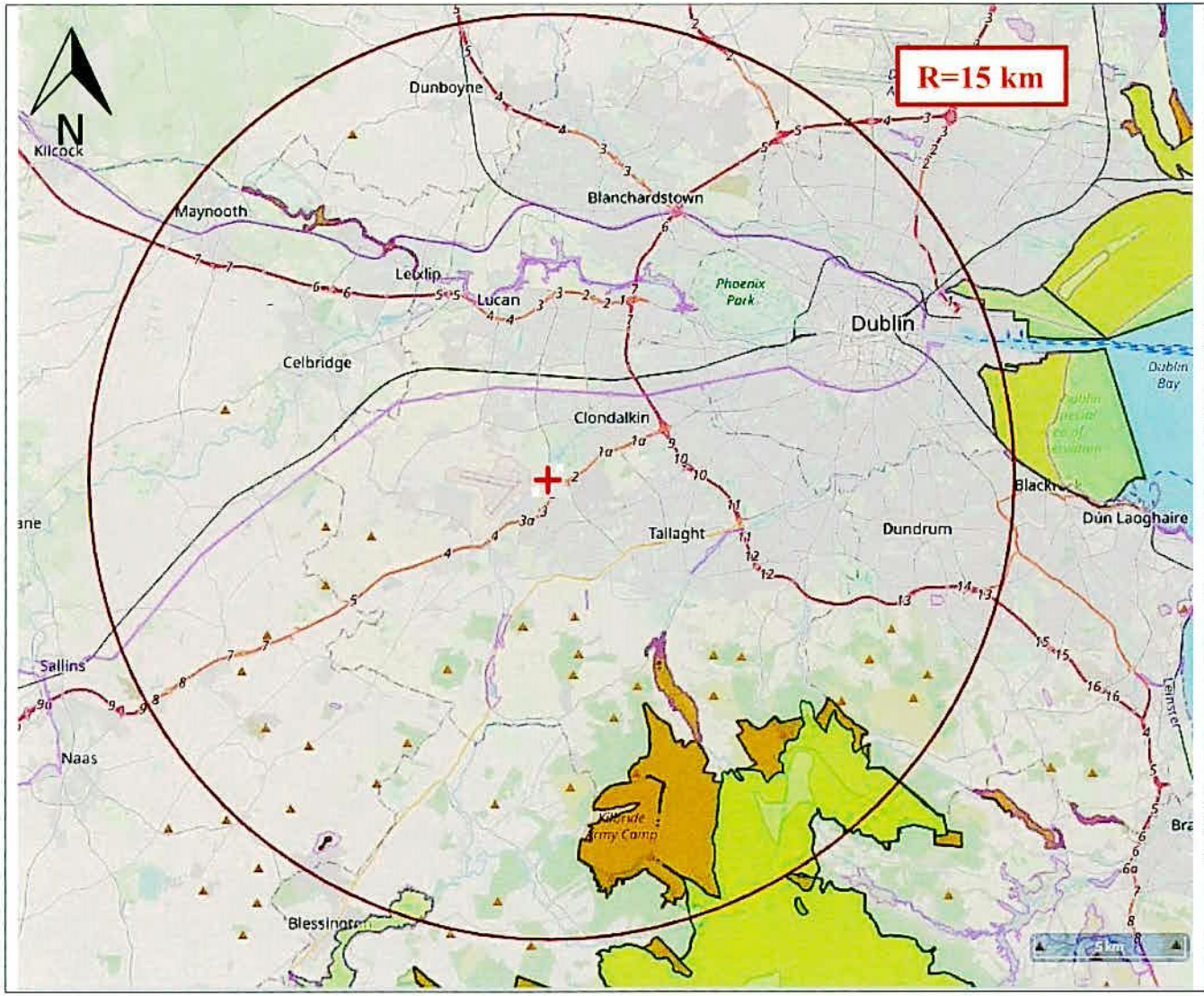
	Checked:		MF
Revision:	Approved:		-
R0	Date:		08/12/2021



Notes

Site Location –

SPA –

SAC –

NHA –

pNHA –

Project Title

PROTECTED SITES MAP

Client Name:

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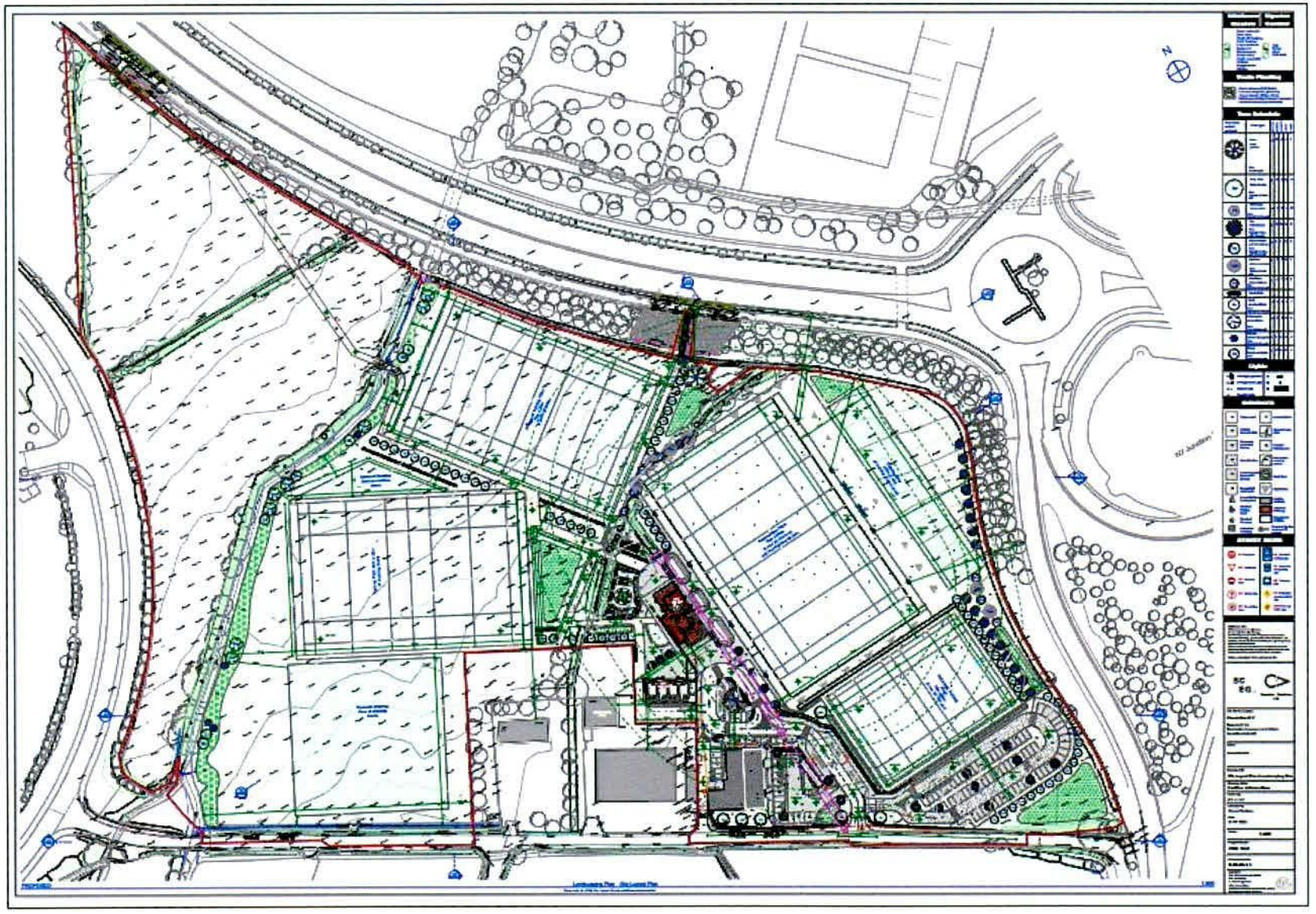
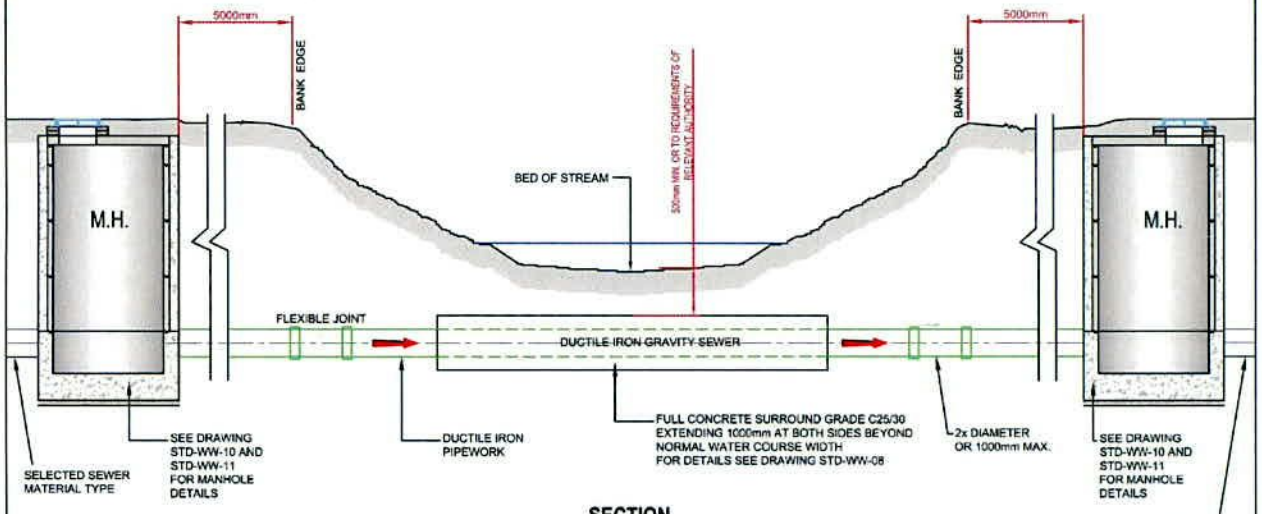
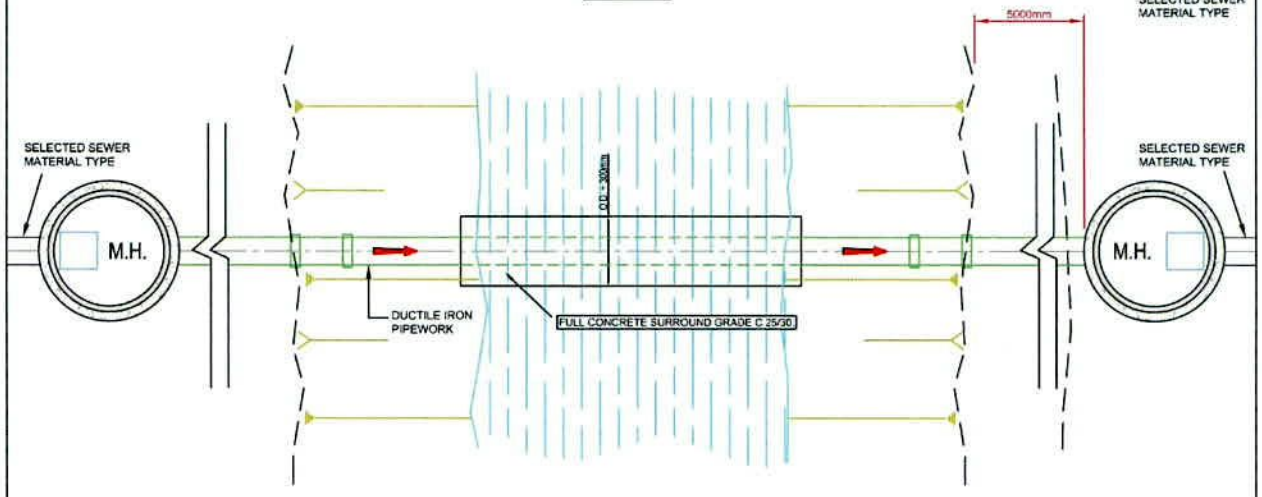
Drawing Status:	Scale:	NTS	A4
Report	Datum:		EPA Envision
Drawing Number: EcIA 21349	Drawn:		PES
	Checked:		MF
Revision:	Approved:		-
R0	Date:		08/12/2021



1. ALL DIMENSIONS IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. O.D. REFERS TO OUTSIDE DIAMETER OF PIPES OR COLLARS.
3. TWO FLEXIBLE JOINTS SHALL BE PROVIDED WITHIN A DISTANCE OF 1000mm OR 2x DIAMETER OF PIPE (WHICHEVER IS THE GREATER) FROM BOTH ENDS OF CONCRETE SURROUND.
4. ALL DUCTILE IRON PIPE WORK AND FITTINGS TO BE IN ACCORDANCE WITH IS EN 598.
5. ALL CONCRETE TO BE IN ACCORDANCE WITH IS EN 206 : 2013.
6. ALL MANHOLES TO BE LOCATED A MINIMUM OF 5000mm FROM THE BANK EDGE TO ALLOW FOR FUTURE ACCESS.
7. BACKFILL AND REINSTATEMENT OF THE RIVER BED AND BANK TO BE SUBJECT TO AGREEMENT WITH RELEVANT AUTHORITY & IRISH WATER.
8. PIPE BETWEEN MANHOLES AT DITCH / STREAM CROSSING TO BE DUCTILE IRON.



SECTION



PLAN

REFER TO INDEX SHEET FOR NOTES REGARDING DESIGN RESPONSIBILITY & RISK ASSESSMENT

No	Date	Drn	Chk	Description	App
2	07/20	RH	TOC	Pipe materials noted, notes added	MOD
1	11/17	JMC	TOC	Updated pipe depth dimension	MOD
0	09/15	JMC	TOC	Initial Issue	SL

STANDARD DETAILS - WASTEWATER

SCALE: NOT TO SCALE | DATE: SEPT. 2015

TITLE: TYPICAL DITCH / STREAM CROSSING FOR GRAVITY SEWER (Sheet 1 of 2)

DRAWING No.: STD-WW-21 | REV: 2