7.0 BIODIVERSITY

7.1 Introduction

This biodiversity chapter has been prepared by Pádraic Fogarty of OPENFIELD Ecological Services. Pádraic Fogarty has worked for over 20 years in the environmental field and in 2007 was awarded an MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EcIA) in Ireland. OPENFIELD is a full member of the Institute of Environmental Management and Assessment (IEMA).

7.2 Study Methodology

The assessment was carried out in accordance with the following best practice methodology: 'Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports by the Environmental Protection Agency (EPA, 2017) and 'Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland' by the Institute of Ecology and Environmental Management (IEEM, 2016).

A site visit was carried out on the 5th of February 2019 and the 25th of April 2019 in fair weather. The site was surveyed in accordance with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2010). Habitats were identified in accordance with Fossitt's Guide to Habitats in Ireland (Fossitt, 2000).

The nomenclature for vascular plants is taken from The New Flora of the British Isles (Stace, 2010) and for mosses and liverworts A Checklist and Census Catalogue of British and Irish Bryophytes (Hill et al., 2009).

April lies within the optimal survey period for general habitat surveys (Smith et al., 2010) and so it was possible to classify all habitats on the site to Fossitt level 3. April is also within the season for surveying breeding birds while February is within the season for surveying large mammals (particularly Badgers).

7.3 Existing Receiving Environment

7.3.1 Zone of Influence

Best practice guidance suggests that an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). However, some impacts are not limited to this distance and so sensitive receptors further from the project footprint may need to be considered as this assessment progresses. This is shown in figure 7.1.

There are a number of designations for nature conservation in Ireland including National Park, National Nature Reserve, RAMSAR site, UNESCO Biosphere reserves, Special Protection Areas (SPA – Birds Directive), Special Areas of Conservation (SAC – Habitats Directive); and Natural Heritage Areas. The mechanism for these designations is through national or international legislation. Proposed NHAs (pNHA) are areas that have yet to gain full legislative protection. They are generally protected through the relevant County Development Plan. There is no system in Ireland for the designation of sites at a local, or

county level. The following areas were found to be located within the zone of influence of the application site:

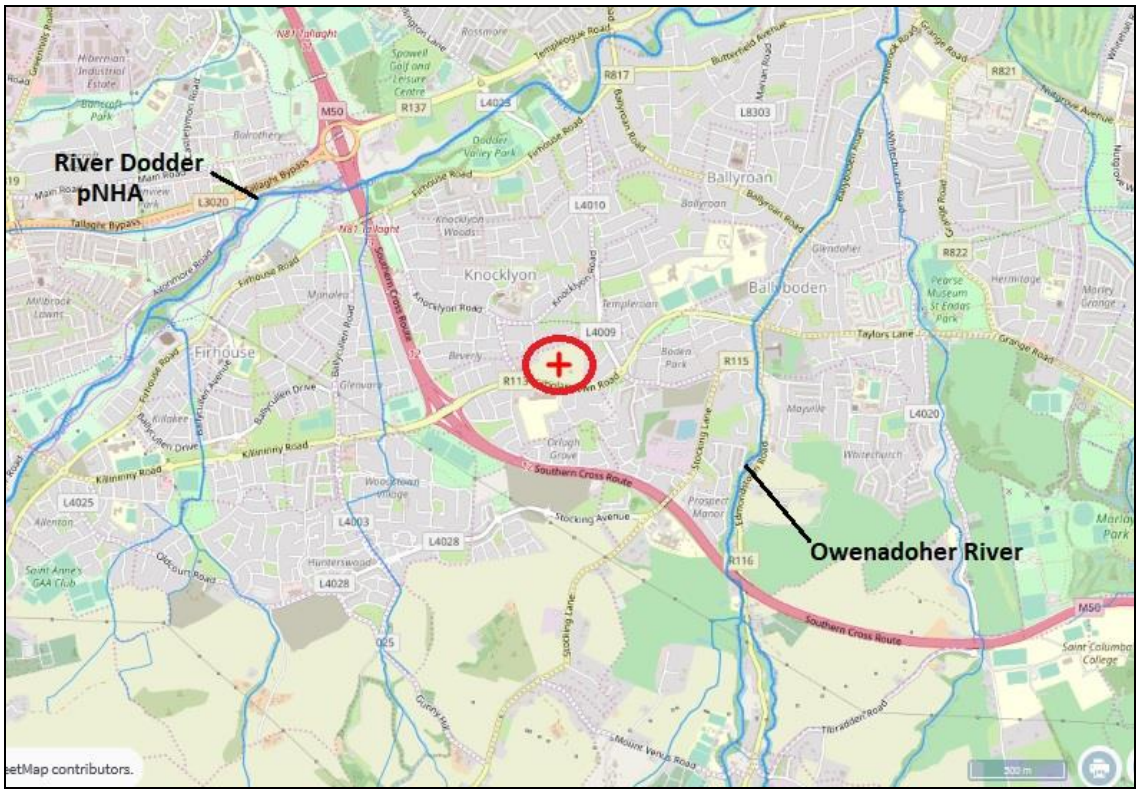

Figure 7.1 – Site Location (Red Circle) Showing Areas Designated for Nature Conservation (From Www.Npws.Ie).

Dodder Valley pNHA (site code: 0991)

Little information is available on the current status of features of conservation value at this site. A short site synopsis has been published and is reproduced here in full:

"This stretch of the River Dodder extends for about 2 kilometres between Firhouse bridge and Oldbawn bridge in the south-west of Dublin city.

The vegetation consists of woodland scrub mainly of Willow (Salix spp.), but up to 13 species of tree have been recorded. Understorey vegetation contains Early Purple Orchid (Orchis mascula) and Bugle (Ajuga reptans). Along the banks there are wild flower meadows with a good diversity of plant species. There is also a pond in the river bed at Firville which has flourished greatly since the floods of 1986.

Forty-eight species of bird have been recorded recently in the area including Little Grebe, Kingfisher, Dipper and Grey Wagtail. Part of the river bank supports a Sand Martin colony of up to 100 pairs.

This site represents the last remaining stretch of natural river bank vegetation of the Dodder in the built up Greater Dublin Area." (NPWS, unknown year)

The NPWS web site (www.npws.ie) contains a mapping tool that indicates historic records of legally protected species within a selected Ordnance Survey (OS) 10km grid square. The

Scholarstown Road lands are located within the square O12 and six protected species are recorded. It must be noted that this list cannot be seen as exhaustive as suitable habitat may be available for other important and protected species. Table 7.1 lists these and their known current status.

Table 7.1 – Known records of protected species from the O12 square (from www.npws.ie)

Species	Habitat [1]	Current status[2]
Galeopsis angustifolia Red Hemp-nettle	Calcareous gravels	Record pre-1970
Hammarbya paludosa Bog Orchid	Wet spongy bogs, usually in tufts of *Sphagnum* moss	Present in O12
Misopates orontium Lesser Snapdragon	Arable fields	No records
Pseudorchis albida Small-white Orchid	Upland pastures and heaths	Record pre-1986
Sanguisorba officinalis Great burnet	Lakes shores and dry banks	Record pre-1970
Cervus nippon Sika Deer	Coniferous woodland and adjacent heaths	Current

Water quality in rivers is monitored on an on-going basis by the Environmental Protection Agency (EPA). It assesses the pollution status of a stretch of water by analysing the invertebrates living in the substrate as different species show varying sensitivities to pollution. It arrives at a 'Q-Value' where Q1 = grossly polluted and Q5 = pristine quality (Toner et al., 2005). The subject lands are within the catchment of the River Dodder, which drains a portion of south County Dublin before joining the River Liffey in Dublin City Centre. A tributary of the Dodder, the Owenadoher Stream, runs to the east of the site although there are no water courses shown from the lands themselves. The Dodder rises in Wicklow Mountains and at its closest point is approximately 1.2km from the site boundary. EPA monitoring points along this river indicate unpolluted status (Q4) as far as Oldbawn. Thereafter the status deteriorates and at Tempelogue is 'poor' (Q3). Both the Dodder and the Owenadoher have been assessed as 'moderate' under the 2010-2015 Water Framework Directive reporting period. This is unsatisfactory status and indicates pollution from point or diffuse sources. These data are taken from the ENVision mapping tool on www.epa.ie.

[1] Hayden & Harrington, 2001
[2] Parnell et al., 2012

7.3.2 Stakeholder Consultation

Because of the relatively low ecological sensitivity of the subject lands, third party observations were not sought.

7.3.3 Site Survey

Aerial photography from the OSI and historic mapping shows that this area has been open grassland but is entirely within the suburban fabric of Dublin city. Built, or hard surfaces can be found on all sides.

7.3.3.1 Flora

The main portion on the land is a **dry meadow – GS2** and has not been recently grazed by animals. There are grasses such as Cock's-foot *Dactylis glomerata* and False Oat *Arrhenatherum elatius* as well as typical grassland plants such as Nettle *Urtica dioica,* Creeping Buttercup *Ranunculus repens,* Ribwort Plantain *Plantago lanceolata* and Curled Dock *Rumex crispus.* Within this field there are three (two houses and associated outbuilding) **buildings – BL3** of relatively modern construction. Within this area of grassland there are a number of mature trees, including Oak *Quercus sp.* and Sycamore *Acer pseudoplatanus.* There is also an expanse of **bare soil – ED2** to the north-east.

The external margins of the field are composed of either modern block **stone walls – BL1** (to the north and east), or **treelines – WL2** (to the south and west). There is also a treeline running between the northern boundary and the residential building. This treeline, along with the western boundary is dominated by non-native Leyland Cypress *Cuprocyparis leylandii* and so is of low biodiversity value.

The southern treeline, running parallel with the Scholarstown Road, contains some tall Oak, Sycamore, Larch *Larix decidua,* Ash *Fraxinus excelsior,* Beech *Fagus sylvatica* and Horse Chestnut *Aesculus hippocastanum.* In the south-west corner of the site, within the treeline and close to a residential home, there is a stand of Three-cornered Garlic *Allium triquetrum* and Spanish Bluebells *Hyacynthoides hispanica.* These are alien invasive species as listed under SI No. 477 of 2011.

These features are shown as a habitat map in figure 7.2.

7.3.3.2 Fauna

The site survey included incidental sightings or proxy signs (prints, scats etc.) of faunal activity, while the presence of certain species can be concluded where there is suitable habitat within the known range of that species. Table 7.2 details those mammals that are protected under national or international legislation in Ireland. Cells are greyed out where suitable habitat is not present or species are outside the range of the study area.

Table 7.2 – Protected mammals in Ireland and their known status within the O12 10km grid square[3]. Those that are greyed out indicate either that there are no records of the species

[3] From the National Biodiversity Data Centre, excludes marine cetaceans

from the National Biodiversity Data Centre. Since the site is not coastal the two Seal species are greyed out.

Species	Level of Protection	Habitat[4]
Otter Lutra lutra	Annex II & IV Habitats Directive; Wildlife (Amendment) Act, 2000	Rivers and wetlands
Lesser horseshoe bat Rhinolophus hipposideros		Disused, undisturbed old buildings, caves and mines
Grey seal Halichoerus grypus	Annex II & V Habitats Directive; Wildlife (Amendment) Act, 2000	Coastal habitats
Common seal Phocaena phocaena		
Whiskered bat Myotis mystacinus	Annex IV Habitats Directive; Wildlife (Amendment) Act, 2000	Gardens, parks and riparian habitats
Natterer's bat Myotis nattereri		Woodland
Leisler's bat Nyctalus leisleri		Open areas roosting in attics
Brown long-eared bat *Plecotus auritus*		Woodland
Common pipistrelle Pipistrellus pipistrellus		Farmland, woodland and urban areas
Soprano pipistrelle Pipistrellus pygmaeus		Rivers, lakes & riparian woodland
Daubenton's bat Myotis daubentonii		Woodlands and bridges associated with open water
Nathusius' pipistrelle Pipistrellus nathusii		Parkland, mixed and pine forests, riparian habitats
Irish hare Lepus timidus hibernicus	Annex V Habitats Directive; Wildlife (Amendment) Act, 2000	Wide range of habitats
Pine Marten Martes martes		Broad-leaved and coniferous forest

[4] Harris & Yalden, 2008

Hedgehog *Erinaceus europaeus*	Wildlife (Amendment) Act, 2000	Woodlands and hedgerows
Pygmy shrew *Sorex minutus*		Woodlands, heathland, and wetlands
Red squirrel *Sciurus vulgaris*		Woodlands
Irish stoat *Mustela erminea hibernica*		Wide range of habitats
Badger *Meles meles*		Farmland, woodland and urban areas
Red deer *Cervus elaphus*		Woodland and open moorland
Fallow deer *Dama dama*		Mixed woodland but feeding in open habitat
Sika deer *Cervus nippon*		Coniferous woodland and adjacent heaths

There was no evidence that Badgers are using the site and no sett was found. There is no suitable habitat for Otter. There was no evidence that Irish Hare is present while habitat is considered too isolated from woodland areas to support Deer, Pine Marten or Red Squirrel. Small mammals such as the Irish Stoat, Hedgehog and Pygmy Shrew are considered more or less ubiquitous in Ireland (Lysaght & Marnell, 2016). No direct evidence of any mammal was recorded although Fox *Vulpes vulpes* and Rabbit *Oryctolagus cuniculus* are common in Dublin along with Brown Rat *Rattus norvegicus,* House Mouse *Mus domesticus* and Field Mouse *Apodemus sylvaticus.* These species are not protected.

Features on the site may be suitable for roosting bats as the mature trees could have cracks and crevices while the buildings also have roost potential (Hundt, 2012). Bats are likely to use the field boundary system for foraging. A detector-based bat survey was carried out by Brian Keeley of Wildlife Surveys Ireland in May 2019. This report is presented separately but its findings are included here. This found no evidence of roosting bats while three species were recorded to be feeding: Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat.

The following birds were noted during the February survey: Robin *Erithacus rubecula,* Magpie *Pica pica,* Blackbird *Turdus merula,* Wood Pigeon *Columba palumbus,* Rook *Corvus frugilegus,* Great Tit *Parus major* and Collared Dove *Streptopelia decaocto*. Suitable nesting habitat is available for common countryside birds in treelines and old trees.

In April the following breeding birds were recorded: Hooded Crow *C. corone,* Blackbird, Magpie, Robin, Wood Pigeon, Jackdaw *C. monedula* and Collard Dove. These species are of low conservation concern/green list (Colhoun & Cummins, 2013).

There are no habitats on the lands suitable for amphibians or fish, with no ponds, water courses or wetland areas. The Dodder itself is of salmonid status, with populations of Atlantic Salmon *Salmo salar,* Brown Trout *S. trutta,* European Eel *Anguilla anguilla,* Lamprey *Lampetra sp.,* Minnow *Phoxinus phoxinus*, Stone Loach *Neomacheilus barbatulus* and Three-spined Stickleback *Gasterosteus aculeatus* (this is an amalgam of all fish sampling points from along the Dodder)[5].

Most habitats are likely to harbour a wide diversity of invertebrates. In Ireland only one insect is protected by law, the Marsh Fritillary butterfly *Euphydryas aurinia,* and this is not to be found on in this area. Other protected invertebrates are confined to freshwater and wetland habitats and are not present on this site.

7.3.4 Overall Evaluation of the Context, Character, Significance and Sensitivity of the Proposed Development Site

In summary, it has been seen that the application site is open grassland with buildings and treeline boundaries. There are no examples of habitats listed on Annex I of the Habitats Directive or records of rare or protected plants. Three-cornered garlic and Spanish Bluebell are present and these are species listed as alien invasive as per SI 477 of 2011.

High value treelines and individual mature trees provide habitat for a wide range of common plants and animals including breeding birds and bats although no roosts are present.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). These are reproduced in table 7.3. From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 7.4.

[5] From www.wfdfish.ie

Figure 7.2 – Habitat Map Of The Subject Lands Superimposed on n Aerial Photograph (photo from www.google.com)

Table 7.3 Site evaluation scheme taken from NRA guidance

2009*Site Rating*	*Qualifying criteria*
A - International importance	SAC, SPA or site qualifying as such. Sites containing 'best examples' of Annex I priority habitats (Habitats Directive). Resident or regularly occurring populations of species listed under Annex II (Habitats Directive); Annex I (Birds Directive); the Bonn or Berne Conventions. RAMSAR site; UNESCO biosphere reserve; Designated Salmonid water

B - National importance	NHA. Statutory Nature Reserves. Refuge for Flora and Fauna. National Park. Resident or regularly occurring populations of species listed in the Wildlife Act or Red Data List 'Viable' examples of habitats listed in Annex I of the Habitats Directive
C - County importance	Area of Special Amenity, Tree Protection Orders, high amenity (designated under a County Development Plan) Resident or regularly occurring populations (important at a county level, defined as >1% of the county population) of European, Wildlife Act or Red Data Book species Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the county
D - Local importance, higher value	Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the locality Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
E - Local importance, lower value	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 7.4 Evaluation of the importance of habitats and species on the Scholarstown Road site

Bare soil – ED2 Stone wall – BL1 Buildings – BL3 Cypress Treeline – WL2	Negligible ecological value
Dry meadow – GS2	Local importance, lower value
Broadleaved treelines – WL2 Stand-alone, mature trees	Local importance, higher value

7.4 Characteristics Of The Proposed Development

The project will see the clearance of all habitat features away from the boundaries. 28 individual trees are to be retained while much of the broadleaved treelines is to be integrated into the project design.

Figure 7.3 – Development overview

7.5 Potential Impact of the Proposed Development

This section provides a description of the potential impacts that the proposed development may have on flora & fauna in the absence of mitigation. Methodology for determining the significance of an impact has been published by the EPA. Table 7.5 summaries the nature of the predicted impacts.

7.5.1 Construction Phase

The following potential impacts are likely to occur during the construction phase in the absence of mitigation:

1. The removal of habitats including grassland, Cypress treelines, buildings, stone walls and bare ground. These are of negligible biodiversity value. The tree survey carried out for this development identified 7 category A trees (high quality), 20 category B (moderate quality), 23 category C (low quality) and 6 category U (trees which should be removed in accordance with good arboricultural practice). No category A trees are to be removed for this development. All six category U trees, 11 category B and 11 category C trees are to be removed along with a Category C hedge. Category U trees are of wildlife value (e.g. in providing standing for fallen dead wood) but are not compatible with housing developments. In addition four treelines, one hedgeline and 0.5m of a separate hedgeline are to be removed. Figure 7.4 shows the tree protection plan. As can be seen, lines of trees to be removed are chiefly low-ecological value evergreens. Most of the broadleaved trees along external boundaries, as well as a high value Oak in the centre, are to be retained. The overall impact of tree/hedge removal on wildlife is assessed as a slight effect in the absence of mitigation.

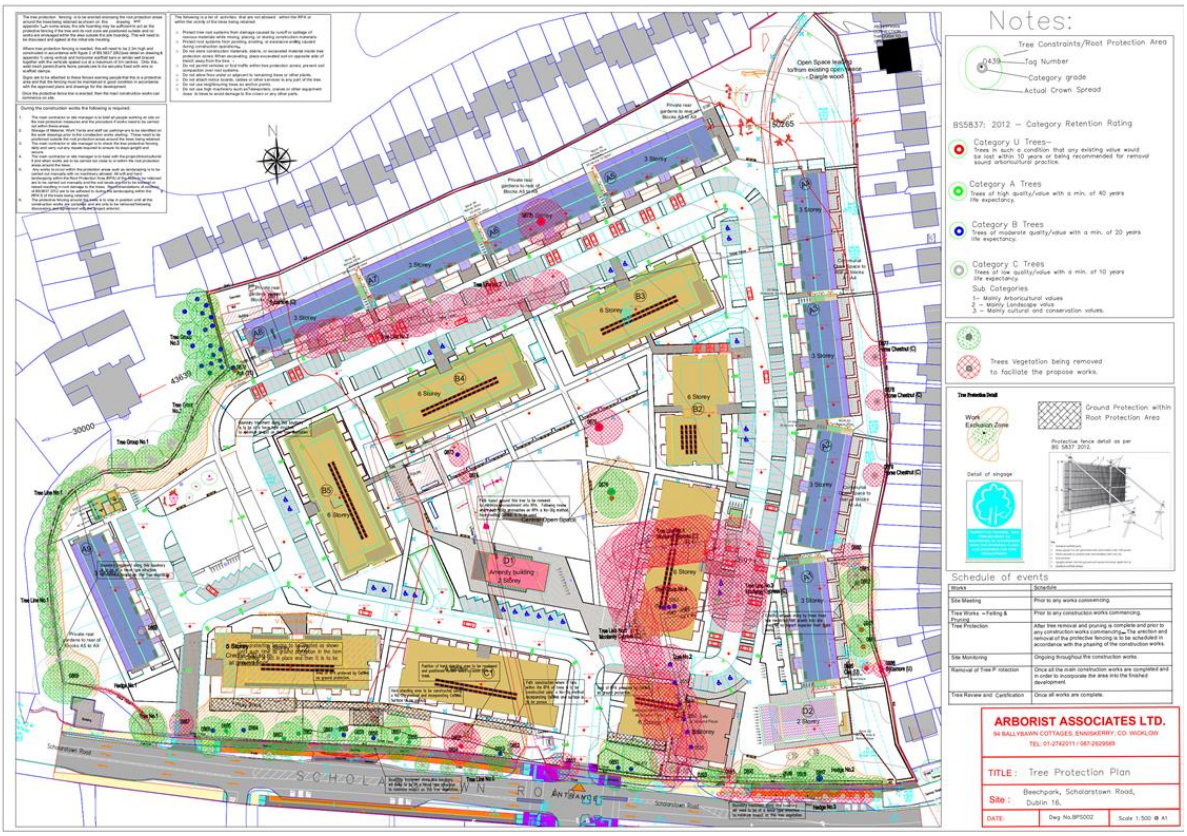

Figure 7.4 – Trees and hedges to be retained (green) and those to be removed (red).

2. The direct mortality of species during demolition. This impact is most acute during the bird breeding season which can be assumed to last from March to August inclusive. This may affect a number of locally common bird species.

   No bat roosts have been identified however certain trees have been highlighted as having bat roost potential and mitigation during tree felling has been recommended in the bat report. A bat box scheme is proposed which will enhance the habitat for bat in this regard.

3. Pollution of water courses through the ingress of silt, oils and other toxic substances. The risk of water pollution from this site is low as there are no direct pathways to water courses. Nevertheless, best practice measures should be followed to ensure that pollution does not occur.

7.5.2 Operation Phase

The following potential impacts are likely to occur during the operation phase in the absence of mitigation:

4. Pollution of water from foul wastewater arising from the development. Wastewater will be sent to the municipal treatment plant at Ringsend. Pre-connection feedback has been received from Irish Water which advises that a connection to the Irish water network can be facilitated. Upgrade works are needed as the plant is not currently meeting its requirements under the Urban Wastewater Treatment Directive. Pollution effects are most acute in freshwater systems where the capacity for dilution is low and the consequent risk of eutrophication is high. The Ringsend WWTP discharges into Dublin Bay which is currently classified as 'unpolluted' by the EPA despite long-running compliance issues at the plant. A separate screening report for Appropriate Assessment specifically examines the impacts of this project on Natura 2000 areas in Dublin Bay however there is currently no evidence that non-compliance issues at the WWTP are having negative effects to features of high ecological value (e.g. wading birds or intertidal habitats). It is understood that Irish Water is to undertake upgrading works on a phased basis and that compliance issues will comprehensively addressed by 2022.

5. Pollution of water from surface water run-off. The Greater Dublin Strategic Drainage Study (2005) identified issues of urban expansion leading to an increased risk of flooding in the city and a deterioration of water quality. This arises where soil and natural vegetation, which is permeable to rainwater and slows its flow, is replaced with impermeable hard surfaces. Surface water is to be maintained entirely separate from the foul network. A new surface water drainage system is to be installed for each site in accordance with the GDSDS. Specifically, this includes attenuation storage and controlled release to the municipal surface sewer. Storm water will be separate from the foul sewer and will ultimately discharge to the River Dodder. Additional SUDS measures include permeable paving on driveways, sedum roofs on apartment buildings and a Class I fuel/oil interceptor prior to discharge to the sewer. No negative effect arising to the quantity or quality of surface run-off will occur.

6. Disturbance from artificial light

There will be an increase in levels of artificial light arising from this project. This kind of disturbance can affect bats in particular, all species of which are sensitive (albeit to varying degrees). The bat report states:

Pipistrelles and Leisler's bats are less affected by light than all other species, but Pipistrelles will avoid light where possible. Leisler's bats may be attracted to lighting later into the night-time to feed on moths that themselves are attracted or disorientated by the lights….

At worst, it would be a permanent moderately negative impact [in the absence of mitigation]

7. Three-cornered Garlic and Spanish Bluebell

The presence of Three-cornered Garlic and Spanish Bluebells are unlikely to pose a threat to high value habitats for species however as they are listed as an invasive species, there is an onus on the developer to prevent its spread. The tree under which it is growing is to be protected during works. A site assessment and a management plan have been prepared by Invasive Plant Solutions and this included a preliminary spray treatment during the 2019 growing period. See Appendix 7.1 and 7.2.

Impacts to protected areas are not predicted to occur, principally due to the separation distance between the site and these areas. A full assessment of potential effects to Natura 2000 areas is contained within a separate Screening Report for Appropriate Assessment. There is no pathway for effects to occur within the Dodder Valley pNHA.

Table 7.5: Significance level of likely impacts <u>in the absence of mitigation</u>

Impact		Significance
Construction phase		
1	Loss of habitat • Negligible value grassland/bare soil/Cypress treeline/stone wall • Higher individual trees/mature trees	Imperceptible Slight effects
2	Mortality to animals during construction	Significant effect
3	Pollution of water during construction phase	Not significant
4	Wastewater pollution	Not significant
5	Surface water pollution	Neutral
6	Artificial lighting	Moderate effect
7	Three-cornered Garlic	Significant effect

Overall it can be seen two significant effects are predicted to occur as a result of this project in the absence of mitigation.

7.5.3 Cumulative Impacts

A number of the identified impacts can also act cumulatively with other impacts from similar developments in this area of Dublin. These primarily arise through the additional loading to the Ringsend Wastewater Treatment Plant. It is considered that this effect is not significant due to the planned upgrading works that will bring it in line with the requirement of the Urban Wastewater Treatment Directive.

In this instance, the incorporation of SUDS attenuation measures will result in not negative effect to surface water quality.

Increasing urbanisation of Dublin, and in particular land use change from open or agricultural to urban uses, is resulting in the loss of habitat for common species of plants and animals. In this case, higher value habitats are to be largely retained while post-construction landscaping will provide additional resources for wildlife.

7.6 Avoidance, Remedial and Mitigation Measures

This report has identified two significant effects therefore mitigation will be required. In addition, best practice site management should be followed to ensure that pollution does not occur during the construction phase.

7.6.1 Mitigation Measures Proposed

The following mitigation measures are proposed for the development:

Construction Phase

1: Disturbance of birds' nests/bats

Deliberate disturbance of a bird's nest is prohibited unless under licence from the National Parks and Wildlife Service. If possible, site clearance works should proceed outside the nesting season, i.e. from September to February inclusive. If this is not possible, vegetation must first be inspected by a suitably qualified ecologist. If a nest is encountered then works must stop, until such time as nesting has ceased. Otherwise, a derogation licence must be sought from the NPWS to allow the destruction of the nest.

The following mitigation is taken from the bat report:

All mature trees shall be checked for the presence of bats prior to felling.

All the mature trees within the site shall be examined for the presence of bats prior to felling by a bat specialist. Should bats be noted in any tree, it is a protected structure and a derogation must be sought as discussed above. Furthermore, should buildings still be in place by the end of 2019, they must be examined by a bat specialist for the presence of bats. If bats are present, the building is a protected structure and derogation must be acquired from NPWS to allow exclusion of bats under specific conditions as proposed or supported by NPWS.

As part of the post-construction phase, 12 artificial bat roosting boxes are to be installed at suitable locations.

2: Pollution during construction

Construction management should follow guidance from Inland Fisheries Ireland (2016). In this instance there are no water courses in this vicinity. Silt laden water will not be allowed to enter surface drains during the construction phase. Water leaving the site can be directed to drains only via a suitably sized silt trap. Full details of how these measures can be implemented will be in included in a Construction Management Plan (CMP) prepared prior to the start of works. A preliminary, planning stage CMP has been prepared by DBFL Engineers and is presented under separate cover as part of this application.

3: Alien Invasive Species

The patch of Three-cornered Garlic and Spanish Bluebell has been assessed by Invasive Plant Solutions and a management plan has been prepared. This recommends that the area be cordoned off, not disturbed in any way and that spraying with herbicide occurs in spring 2020 when the plant is in growth phase. Further spraying treatment may be required.

7.7 Predicted Impacts of the Proposed Development

This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied.

After mitigation, no significant residual, significant effects are likely to arise to biodiversity arising from this project.

7.8 Monitoring

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant. In this case no significant negative effects are likely to arise, and so additional monitoring is not required.

7.9 Interactions

There are interactions between the biodiversity chapter and the chapters on water/hydrology and landscaping. The inclusion of SUDS measures within the surface water attenuation systems in particular will ensure that no negative effects occur to water quality. The landscaping scheme includes new planting which will provide habitat for birds, invertebrates and other common wildlife.

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