

APPENDIX 09

Biodiversity

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Bat Survey

Proposed Strategic Housing Development

Cloghroe

Tower

Co. Cork

Report, prepared for Cloghroe Development Limited

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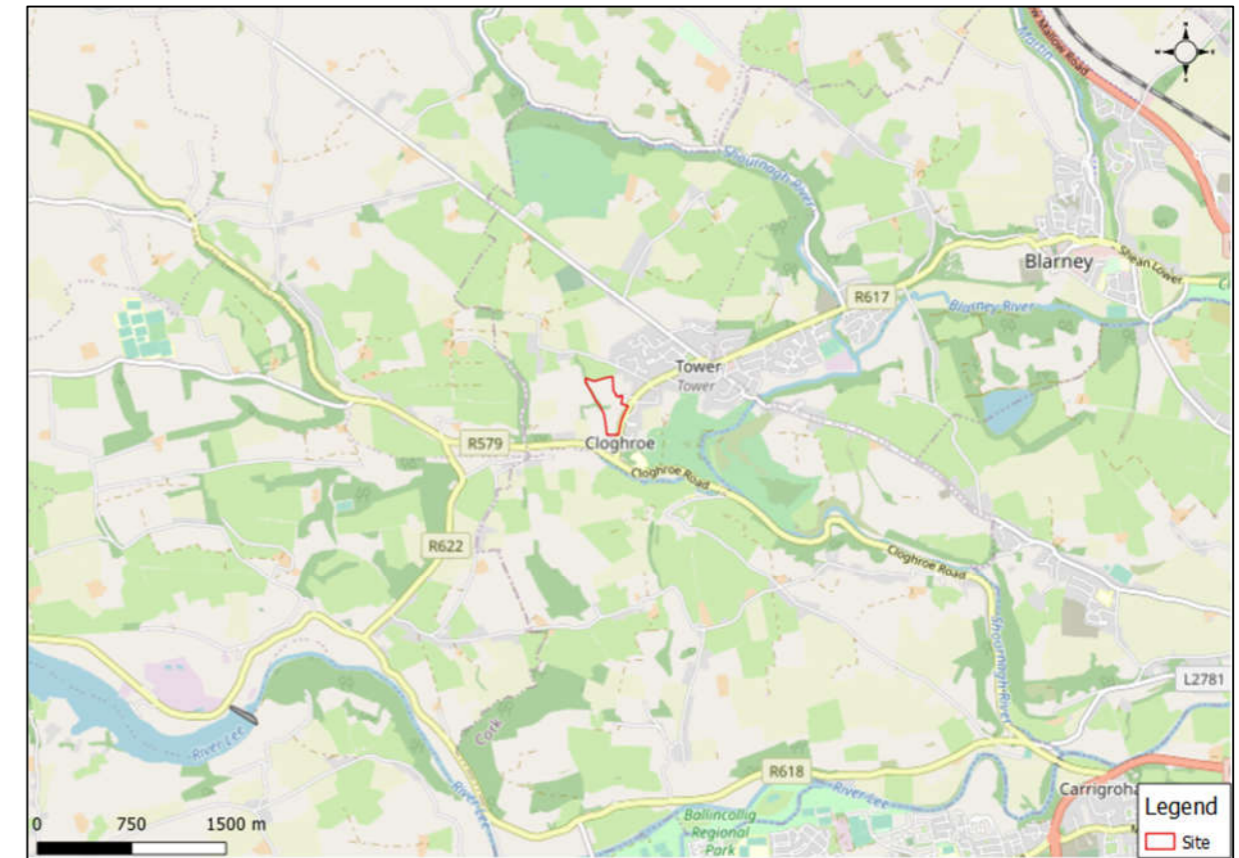
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1 Introduction

Greenleaf Ecology was commissioned by Cloghroe Development Limited to undertake a bat survey for the proposed strategic housing development [SHD] at Cloghroe, Tower, Co. Cork. The location of the proposed site is illustrated in Figure 1-1.

Figure 1-1: Site location map



1.1 Proposed Development

Cloghroe Development Limited is applying for planning permission for the construction of a mixed-use residential and retail development and all ancillary site development works, including the demolition of 2 no. existing agricultural structures at Coolflugh, Cloghroe, Tower, Cork. The proposed residential development comprises the construction of 198 no. residential units, two storey creche, two storey café building and single storey retail food store. The proposed development provides for 117 no. dwelling houses consisting of 5 no. 4 bedroom detached houses, 44 no. 4 bedroom semi-detached houses, 8 no. 4 bedroom townhouses, 14 no. 3 bedroom semi-detached houses, 24 no. 3 bedroom townhouses and 22 no. 2 bedroom townhouses. The proposed development includes 81 no. apartment/duplex units consisting of 2 no. 3 bedroom, 35 no. 2 bedroom and 44 no. 1 bedroom units. 79 no. of the proposed apartment/duplex units will be provided in 6 no. 3 storey apartment buildings with ancillary communal areas and bicycle parking facilities. 2 no. apartment units will be provided at first floor level of a proposed café building to the south of the site.

The proposed retail development consists of a single storey retail food store with a net sales area of 1,315 m² (which includes the sale of alcohol for consumption off premises) with ancillary signage, surface car park, servicing areas and bicycle parking facilities. The proposed development includes a proposed two storey café building with café on ground floor and 2 no. apartments at first floor level.

Access to the proposed development will be via 2 no. entrances from the R617, one which will serve the proposed residential development and one to serve the proposed retail development. A separate pedestrian entrance is to be provided from the existing cul-de-sac to the north east of the site. The proposed development makes provision for the upgrade of the R617, including the installation of footpath/cycle infrastructure, signalised pedestrian crossing and the relocation of the existing public bus stop to the west of the R617. Ancillary site development works include flood defence works, public realm upgrades, amenity walks, public open spaces and an urban plaza to the east of the proposed retail unit.

1.2 Legislative Context

All Irish bats are protected under the Wildlife Acts. Also, the EU Habitats Directive, and Irish implementing legislation, seeks to protect rare species, including bats, and their habitats, and requires that appropriate monitoring of populations be undertaken. Moreover, the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all bat species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) protects migrant bat species across all European boundaries. Ireland has ratified both these conventions.

All bats are listed in Annex IV to the Habitats Directive (92/43/EC) and the Lesser Horseshoe bat is further listed under Annex II to the same Directive.

Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence. Any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by the NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "*Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences*".

1.3 Objectives

The objectives of the bat survey were to: -

- Establish the location of any actual or potential bat roosts at the proposed site;
- Establish the value of the proposed site to bats for foraging and commuting;
- Assess the results of the survey and determine the potential impact of the proposed development on any bats that might use the site;
- Provide recommendations for the project design in light of the survey results as appropriate; and
- Provide recommendations for mitigation measures.

2 Methodology

2.1 Desk Study

A pre-survey data search was conducted in order to collate existing information from the footprint of the proposed development site and the surrounding area on bat activity, roosts and landscape features that may be used by bats. The data search comprised the following information sources:

- Collation of known bat records from within a 4km radius¹ of the proposed site from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie);
- Review of Ordnance Survey mapping and aerial photography of the proposed study area and its environs;
- Records of European sites from within a 15km radius and nationally designated sites from within a 5km radius of the proposed site where bats form part or all of the reason for designation (<https://www.npws.ie/protected-sites>); and
- Review of bat survey data from environmental assessments (including Ecological Impact Assessments, Environmental Impact Assessments and Appropriate Assessment) in respect of other proposed and permitted developments in the general area of the site.

2.2 Field Survey

This bat survey was cognisant of the following guidelines: -

- Bat Conservation Ireland, (2010). Guidance notes for Planners, Engineers, Architects, and Developers;
- BTHK. (2018). Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK;
- Collins, J. (ed.) (2016). Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd ed.). The Bat Conservation Trust, London; and
- Kelleher, C. & Marnell, F. (2006). Bat Mitigation Guidelines for Ireland.

2.2.1 Surveyor Information

The survey was undertaken by Karen Banks, MCIEEM.

Karen is an ecologist with 15 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University, and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS. Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes. Karen has also represented Cork County Council as an expert witness for bats at an Oral Hearing.

¹ A 4km radius search distance was selected to encompass records of bat roosts within Core Sustainance Zones (CSZ) of the study area for Irish species of bat. A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the conservation status of the colony using the roost (Collins, 2016).

2.2.2 Bat Roost Survey

2.2.2.1 Preliminary Ecological Appraisal

Walkover surveys of areas within the proposed site identified as potential roosting, foraging and commuting habitats during the desk top study were undertaken in May 2021 (site boundary illustrated in (Figure 2-1). Potential bat habitat was assessed using the criteria outlined in Table 2-1².

Table 2-1: Criteria for Assessing the Potential Suitability of the Proposed Development Site for Bats

Suitability	Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only- the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.2.2.2 Bat Roost Inspection Survey

Trees

A detailed inspection of the exterior of trees was undertaken during the course of the site walkovers to ascertain whether any features that bats could use for roosting (Potential Roost Features, or PRFs) were present. The objective of the survey was to determine the actual or potential presence of bats to carry out an impact assessment and determine the need for further survey and/or mitigation.

A detailed inspection of each potential tree roost within the site was undertaken. The inspection was carried out in daylight hours from ground level, and information was compiled on the tree, PRFs and evidence of bats. All trees surveyed were numbered and marked on a map and a description of each PRF observed was recorded (Figure 3-1 and Figure 3-2). PRFs that may be used by bats include: -

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;
- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. In the current survey, potential roost sites were viewed by a bat specialist working from ground level. Trees were categorised according to the highest suitability PRF present.

Structures

The buildings at the proposed site were surveyed for potential roost sites and signs of bats. The survey utilised a high powered torch, close focussing binoculars and an endoscope (Explorer Premium 8803 with 9mm camera) where appropriate. The external inspection involved looking for bat droppings on the ground, stuck to walls, windowsills or in crevices in the stone work and recording suitable entry and exit points. The internal inspection involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

2.2.2.3 Bat Activity Survey

Bat activity surveys were conducted within the proposed site using an Anabat Walkabout detector, which records bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data were then

² Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

downloaded and all recordings were analysed using the Anabat Insight spectrogram sound analysis software Version 1.9.9. Dusk activity surveys (from sunset, for a minimum of 90 minutes) were conducted. These surveys enable a determination of the approximate numbers and species of bats present within the site, areas used for foraging and commuting routes to and from roosts. The approximate flying height and direction taken by bats were estimated and detailed where possible.

Assessment of bat activity was undertaken in May 2021 and September 2021. A total of 3 dusk activity surveys were completed and were undertaken on 10th May, 17th May and 27th September 2021. Each survey was conducted in appropriate weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below (10°C).

Table 2-2: Cloghroe Residential Development: Bat Activity Survey Dates and Conditions

Survey Date	Times	Weather conditions
10/05/2021	21:05- 22:45, sunset 21:12	Precipitation: none, temperature at sunset: 10°C, wind F4, oktas 6
17/05/2021	21:20- 22:55, sunset 21:23	Precipitation: none, temperature at sunset: 11°C, wind F2, oktas 4
27/09/2021	19.15- 20.55, sunset 19.22	Precipitation: none, temperature at dusk: 11°C, wind F3, oktas 3

In order to supplement the information gathered from the manual activity surveys, a passive monitoring system of bat detection was also deployed for this survey scheme (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). This results in a far greater sampling effort over a shorter period of time. Bats are identified by their ultrasonic calls. The passive detectors record bat ultrasonic calls on a continuous basis and store the information onto an internal SD card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded.

Passive monitoring was completed in May 2021 and September 2021 using the Anabat Express and Anabat Swift bat monitors. The passive monitoring survey was undertaken in accordance with *Bat Surveys for Professional ecologists: Good Practice Guidelines* (Collins, J. (2016). Weather conditions were mixed during the monitoring, with spells of heavy rain and low temperatures at night. One Anabat Express monitor and two Anabat Swift monitors were deployed for the survey and were positioned in hedgerows at three different locations (illustrated in Figure 2-1). The detectors were set to record from approximately 30 minutes before sunset until sunrise and recorded for 7 nights at each location. Data were then downloaded and bat echolocation calls were later analysed by the Anabat Insight software analysis programme version 1.9.9. Each time-stamped file was analysed and the species of bat recorded was noted as a bat pass.

2.3 Survey Limitations

Brown long-eared bats can be difficult to detect as they echolocate at a low-amplitude and foraging bats often make no sound.

The survey design aimed to increase the likelihood of recording these species by the employment of full spectrum monitoring and the positioning of passive monitors at commuting routes, natural corridors through or adjacent to vegetation and suitable brown long-eared bat habitats (such as woodland edge and hedgerows).

As noted previously, the dusk activity transect surveys were undertaken in suitable weather conditions. However, weather conditions were mixed during the passive monitoring, with spells of heavy rain in May and September and low temperatures at night in May. This is likely to have affected levels of bat activity recorded.

Figure 2-1: Cloghroe Residential Development: location of passive monitors, May and September 2021.



3 Results

3.1 Existing Bat Data

The review of existing records of bat species in the area of the site indicates that six of the ten known Irish species of bat have been recorded within a 4km radius of the proposed site (last checked September 2021). These bats include pipistrelle species (*Pipistrellus pipistrellus sensu lato*) and soprano pipistrelle (*P. pygmaeus*), Leisler’s bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), Daubenton’s bat (*Myotis daubentonii*) and Natterer’s bat (*M. nattereri*) as shown in Table 3-1 below. Of these species, Daubenton’s bat has been recorded roosting in a building located c.3.7km to the east of the site.

Table 3-1: NBDC bat records from within a 4km radius of the proposed site.

Common Name	Scientific Name	Present	Known Roost	Date of Last Record
Pipistrelle sp.	<i>Pipistrellus pipistrellus sensu lato</i>	√		25/07/2014
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	√		25/07/2014
Nathusius’s Pipistrelle	<i>Pipistrellus nathusii</i>			
Leisler’s Bat	<i>Nyctalus leisleri</i>	√		29/07/2013
Brown Long-eared Bat	<i>Plecotus auratus</i>	√		01/08/2006
Daubenton’s Bat	<i>Myotis daubentonii</i>	√	√	07/08/2014
Whiskered Bat	<i>Myotis mystacinus</i>			
Natterer’s Bat	<i>Myotis nattereri</i>	√		01/08/2006
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>			
Brandt’s Bat	<i>Myotis brandtii</i>			

The bat landscape association model (Lundy *et al*, 2011) suggests that the proposed site is part of a landscape that is of high suitability for bats including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle, brown long-eared, Leisler’s, Daubenton’s, natterer’s and whiskered bat. The proposed site and its environs are of low suitability for Nathusius’ pipistrelle and is outside of the core distribution range for lesser horseshoe bat (*Rhinolophus hipposideros*) (Roche *et al*, 2014).

A bat assessment was undertaken for a proposed residential development at St. Ann’s Hydro Hill at Tower (Abbott, I., 2017), located c.1.4km to the north-east of the proposed site at Cloghroe. Eight species of bat were recorded during the course of the site surveys; common pipistrelle, soprano pipistrelle, Leisler’s, brown long-eared, whiskered, natterer’s, Daubenton’s and a single occurrence of lesser horseshoe bat. Evidence of minor bat roosts of brown long-eared bat and whiskered bat in stone ruins on site was found, indicating use as small day-time roost and as a ‘night roost’. These species may also roost adjacent to the site. Summer roosts of common pipistrelle, soprano pipistrelle and Leisler’s bat also occur just off-site to the west, within close vicinity, with the exact roost locations remaining unknown. Natterer’s bat social calls associated with roost behaviour were recorded at a veteran Monterey Pine on site. No subsequent surveys were at this site.

3.1.1 Designated Sites

There are no European sites located within a 15km radius or nationally designated site located within a 5km radius of the proposed site which include bats as a Qualifying Interest (QI).

3.2 Bat Roost Survey

3.2.1 Preliminary Ecological Appraisal

The proposed site comprises fields of improved agricultural grassland (Fossitt code GA1) and wet grassland (GS4) bound by hedgerows (WL1) and treelines (WL2). The Dromin Stream (FW1), which is a first order watercourse, runs from north to south along the western boundary of the proposed site. This stream flows to the third order Currabeha River to the south of the proposed site. Drainage ditches (FW4) are present in association with the hedgerows and treelines in the lower lying field to the south of the site and a ditch is also present within the wet grassland running from east to west. An area of wet willow woodland (WN6) is located to the east of the site.

The site supports connectivity to the wider landscape via the hedgerows/ treelines, woodland and a stream present at the site. In accordance with the criteria outlined in Table 2-1, the commuting and foraging habitats over the site are of high suitability for bats.

A summary of foraging and roosting habitats for Irish bats is included in Table 3-2.

Table 3-2: Brief description of Irish bat species (conservation status of each species is derived from NPWS (2019)³).

Species	Description
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	This species was only recently separated from its sibling, the soprano or brown pipistrelle <i>P. pygmaeus</i> , which is detailed below (Barratt et al, 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland. The conservation status of this species is Favourable.
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. The pipistrelles are the smallest and most often seen of our bats, flying at head height and taking small prey such as midges and small moths. Summer roost sites are usually in buildings but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer. The conservation status of this species is Favourable.
Nathusius' pipistrelle (<i>Pipistrellus nathusii</i>)	Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, 2000) and also in Fermanagh, Longford and Cavan. It has also been recorded in Counties Cork and Kerry (Kelleher, 2005). However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The conservation status of this species is Favourable.
Leisler's bat (<i>Nyctalus leisleri</i>)	This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the

Species	Description
	earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. The conservation status of this species is Favourable.
Brown long-eared bat (<i>Plecotus auritus</i>)	This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversized ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings. The conservation status of this species is Favourable.
Natterer's bat (<i>Myotis nattereri</i>)	This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.
Daubenton's bat (<i>Myotis daubentonii</i>)	This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.
Whiskered bat (<i>Myotis mystacinus</i>)	This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The conservation status of this species is Favourable.

³ For a more comprehensive overview see Roche *et al* (2014).

Species	Description
Brandt's bat (<i>Myotis brandtii</i>)	According to NPWS (2013), whiskered and Brandt's bats are cryptic species and can only be told apart using DNA techniques. Brandt's bat has been confirmed only once from Ireland; a single specimen found in 2003 in Wicklow (Mullen, 2006). Following this discovery, an intensive re-survey, involving DNA testing, was undertaken of all known whiskered bat roosts in Ireland, by the Centre for Irish Bat Research. Woodland mist-netting was also conducted for the species. Despite the extensive survey-work, no further Brandt's bats were identified. The most recent Red Data List for Irish Mammals (Marnell <i>et al.</i> 2009) lists Brandt's bat as data deficient. There is no evidence of any roosts for this species in the country and at present the single record for the species is considered an anomaly. Boston <i>et al.</i> , (2010) concluded that " <i>M. brandtii</i> cannot currently be considered a resident species. This species is now considered a vagrant to the country and consequently, a detailed assessment has not been carried out.
Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Inadequate.

3.2.2 Bat Roost Inspection Survey

Trees

No trees within the study area were being used as roost sites during the course of the surveys undertaken in 2021. A total of four trees within the proposed site were categorised as being of moderate suitability for roosting bats (as defined in Table 2-1) as they contained one or more potential roost features, but none are suitable for use by larger numbers of bats on a regular basis due to their size and lack of protected, sheltered conditions. Potential tree roosts are illustrated in the

photographs in Figure 3-1. The location of the trees with suitability for roosting bats is illustrated in Figure 3-2 and detailed in Table 3-3.

Table 3-3: Cloghroe Residential Development: potential tree roosts

PTR Number	Tree Species	BCT Category	PRFs
1	Willow	Moderate	Crack in main stem
2	Oak	Moderate	Crack in limb and rot hole
3	Ash	Moderate	Crack in limb and butt rot
4	Ash	Moderate	Tear out in main stem

Figure 3-1: Cloghroe Residential Development: illustrations of potential tree roosts


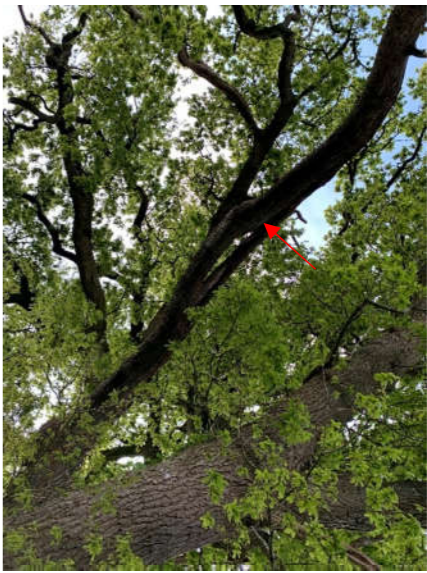


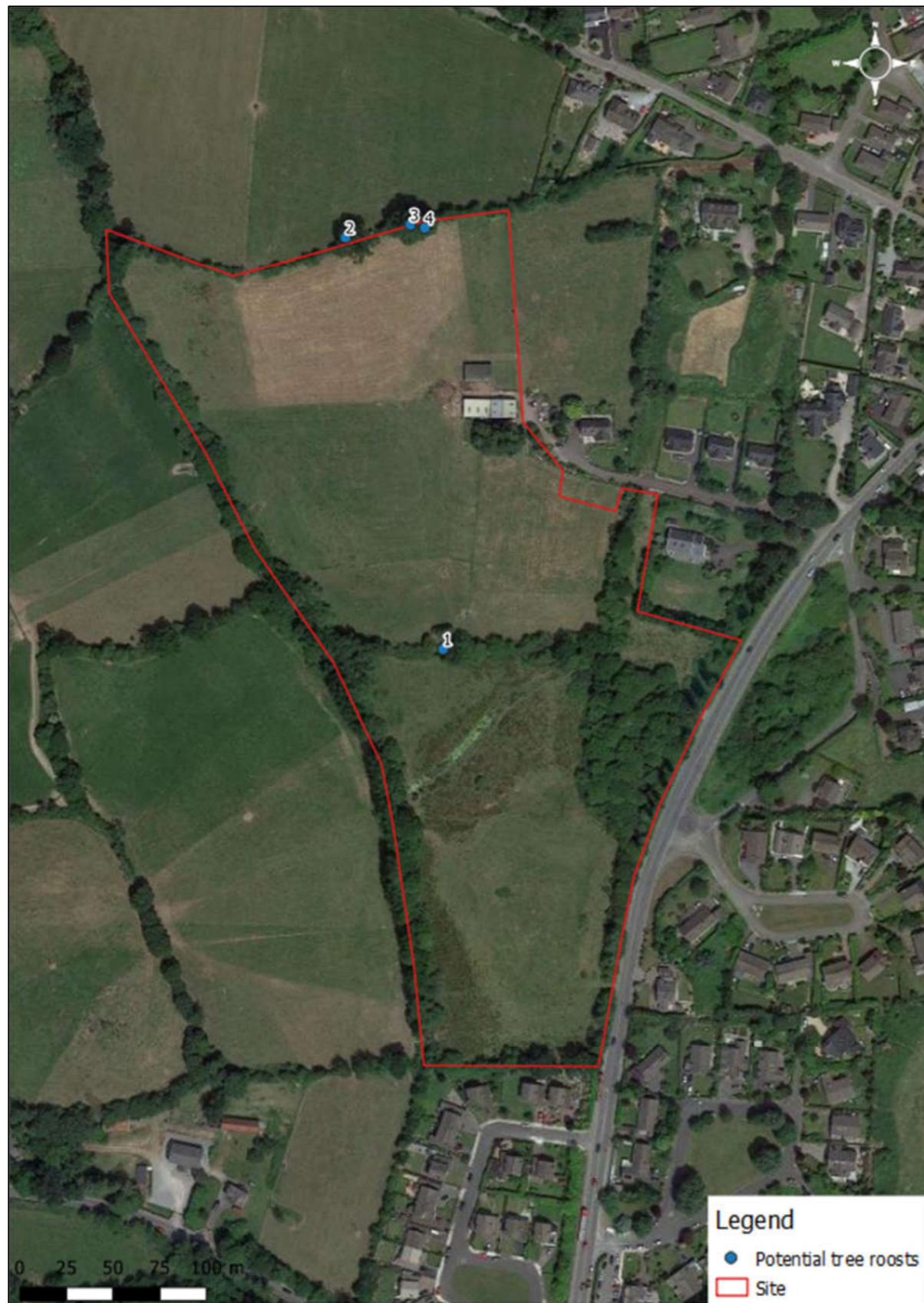
	
1. Crack in main stem of Willow in the hedge running east to west at the centre of the site.	2. Crack in limb of Oak on the northern site boundary.
	
3. Butt rot in Ash on the northern site boundary.	4. Large crevice in tear out in Ash on the northern site boundary.

Figure 3-2: Cloghroe Residential Development: location of potential tree roosts



Structures

Buildings within the proposed site are limited to two agricultural sheds located at the north-east of the proposed site (Plate 3-1). The sheds are constructed of corrugated metal with a steel frame. The buildings are open and draughty and are of negligible suitability for roosting bats. Field surveys of these buildings confirmed that they are not used as roosting sites by bats.

Plate 3-1: Agricultural shed present to the north-east of the proposed site



3.3 Activity Survey

Seven bat species were recorded during passive monitoring undertaken over 5 nights in May 2021 and 5 nights in September 2021. Bat activity was generally high at the site; however, low levels of activity were recorded during extended periods of heavy rain (heavy rain was recorded on the passive monitors). The most frequently recorded species was common pipistrelle, followed by soprano pipistrelle then Leisler's bat. These species were all recorded foraging across the site. Leisler's bat was recorded early in the evening (13 minutes before sunset) on PM 3 to the north of the site and soprano and common pipistrelle were recorded c.16 minutes after sunset on all three passive monitors in May 2021. Soprano and common pipistrelle social calls were also recorded on the passive monitors in May and September 2021. Natterer's, Daubenton's and *Myotis* species of bat (unidentifiable to species level) were recorded commuting and foraging across the site. Whiskered bat was not recorded at the site in May, however this species was recorded across the site in September. One brown long-eared bat call was recorded alongside the Dromin Stream in May and a small number of calls that were not of sufficient quality to enable call identification were also recorded on all three monitors (

Table 3-4).

The calls recorded on the passive monitors are summarised in

Table 3-4. The location of the passive detectors is illustrated in Figure 2-1.

Table 3-4: Cloghroe Residential Development- summary table of total bat passes recorded on the passive monitors, May and September 2021.

Species	PM1		PM2		PM3		Total
	May 2021	Sept 2021	May 2021	Sept 2021	May 2021	Sept 2021	
Common Pipistrelle	782 (86%)	974 (57%)	952 (56%)	792 (73%)	713 (48%)	689 (71%)	4,902
Soprano Pipistrelle	67 (7%)	580 (34%)	306 (18%)	231 (21%)	469 (32%)	137 (14%)	1,790
Pipistrelle species ⁴	30 (3%)	20 (1%)	7 (0%)	3 (0%)	21 (1%)	8 (1%)	89
Leisler's	18 (2%)	127 (7%)	436 (25%)	36 (3%)	283 (19%)	87 (9%)	987
Brown Long-eared	0	0	0	0	1 (0%)	0	1
Natterer's	2 (0%)	1 (0%)	4 (0%)	4 (0%)	0	1 (0%)	12
Daubenton's	0	1 (0%)	2 (0%)	0	0	9 (1%)	12
Whiskered	0	4 (0%)	0	2 (0%)	0	1 (0%)	7
Myotis Species	1 (0%)	3 (0%)	4 (0%)	11 (1%)	0	28 (3%)	47
No ID	7 (1%)	1 (0%)	1 (0%)	0	1 (0%)	5 (1%)	15
Total	907 (100%)	1711 (100%)	1712 (100%)	1079 (100%)	1488 (100%)	965 (100%)	7,862

The bat activity transect surveys undertaken in May and September 2021 recorded three species of bat within the proposed site. These species were common pipistrelle, soprano pipistrelle and Leisler's bat.

Leisler's bat was recorded early in the evening (c.7 minutes before sunset) flying into the site from a north-easterly direction during the May transect survey. No bat roost was recorded within the proposed site; it is likely that a Leisler's bat roost is present within one of the houses to the north-east of the site, however the exact location was not recorded. Leisler's foraged extensively over the site for the duration of the activity surveys undertaken in May but were present in lower numbers in September.

Common pipistrelle was recorded foraging along the hedgerows across the site, with the highest level of activity along the western boundary and along the hedgerows in sheltered areas to the centre and south of the site. Soprano pipistrelle was recorded in lower numbers foraging along the hedgerows across the site in May and September.

A lower level of bat activity was recorded alongside the R617 to the east of the site.

4 Evaluation of Survey Results

A review of existing bat records from within a 4km radius of the proposed site indicates that six of the ten known Irish bat species had been observed. These include pipistrelle species, soprano pipistrelle, Leisler's, brown long-eared, Daubenton's and Natterer's bat. Of these species, Daubenton's bat has been recorded roosting within 4km of the site. In addition to these species, whiskered bat and lesser horseshoe bat have been recorded foraging at St. Ann's Hydro Hill at Tower (Abbott, I., 2017), located c.1.4km to the north-east of the proposed site at Cloghroe. Evidence indicating minor bat roosts of brown long-eared bat and whiskered bat was also recorded St. Ann's Hydro Hill, and summer roosts of common pipistrelle, soprano pipistrelle and Leisler's bat also occurred just off-site to the west.

Habitats within the proposed site that are of potential use by foraging and commuting bats include linear features such as the Dromin Stream, hedgerows, treelines and their associated wet ditches, which provide connectivity between the site and other foraging areas in the wider landscape. Overall, the study area is considered to be of high suitability for foraging and commuting bats due to the presence of connectivity to other suitable habitats in the wider landscape. However, roosting opportunities at the site are limited to 4 trees in the field boundaries that support potential roosting features such as cracks in limbs.

Results from the bat surveys undertaken in May and September 2021 indicate that five species of bat, namely soprano pipistrelle, common pipistrelle, Leisler's bat, natterer's and Daubenton's bat regularly commute to the site to forage. Whiskered bat was recorded at the site in the autumn season; and brown long-eared bat was recorded on one occasion on the passive monitors in May, however this species echolocates quietly and, as such, may be under recorded at the site. The level of activity and diversity of species recorded within the proposed site was high. Leisler's bat was recorded early in the evening in May and it is considered likely that a summer Leisler's bat roost is present within one of the houses to the north-east of the site, outside of the site boundary. Soprano and common pipistrelle were recorded relatively close to sunset in May and it is likely that these species also roost nearby in summer.

In relation to the foraging and commuting bat species recorded at the site, the bat populations are considered to be of Local Interest (Higher Value) (in accordance with NRA, 2009).

The status of Irish bat species (Marnell *et al.*, 2019) is summarised in

⁴ *Pipistrellus* spp. which have frequency of maximum energy, FMAXE, of c. 50kHz which cannot reliably be assigned to Common Pipistrelle (typical FMAXE of c. 45kHz) or Soprano Pipistrelle (FMAXE c. 55kHz)

Table 4-1. The bat species recorded at the site are all of Least Concern.

The conservation status of all the bats recorded at the site is Favourable (NPWS, 2019).

Table 4-1: Status of Irish Bat Fauna (Marnell et al., 2019).

Species: Common Name	Irish Status	European Status	Global Status
Resident Bat Species			
Daubenton's bat (<i>Myotis daubentonii</i>)	Least Concern	Least Concern	Least Concern
Whiskered bat (<i>Myotis mystacinus</i>)	Least Concern	Least Concern	Least Concern
Natterer's bat (<i>Myotis nattereri</i>)	Least Concern	Least Concern	Least Concern
Leisler's bat (<i>Nyctalus leisleri</i>)	Least Concern	Least Concern	Least Concern
Nathusius' pipistrelle (<i>Pipistrellus nathusii</i>)	Least Concern	Least Concern	Least Concern
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	Least Concern	Least Concern	Least Concern
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Least Concern	Least Concern	Least Concern
Brown long-eared bat (<i>Plecotus auritus</i>)	Least Concern	Least Concern	Least Concern
Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	Least Concern	Near threatened	Least Concern
Possible Vagrants			
Brandt's bat (<i>Myotis brandtii</i>)	Not Assessed	Least Concern	Least Concern
Greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>)	Not Assessed	Near threatened	Least Concern

of feeding sites for bats and would be a long-term significant adverse impact at the local geographic scale.

6 Mitigation

6.1 Construction Phase

6.1.1 Loss of Foraging and Commuting Habitat

Loss of commuting and foraging habitat at the site will be mitigated by the landscaping proposals, which include retention of hedgerows and wooded areas on-site; which will be protected from any accidental damage during construction through use of measures such as fencing. Protective fencing barriers will be installed as outlined in Section 6.2, Barriers and Ground Protection, of BS 5837. Measures will be taken to ensure that trees and hedges being retained are incorporated into the development without being impacted upon. Protective fencing will be provided around trees and hedge vegetation being retained and this will enclose their Root Protection Areas (RPAs). The fencing will be at least 2.3m. Similarly, a buffer is to be maintained between site and neighbouring stream and riparian margin.

To mitigate for the loss of hedgerow and partial removal of woodland, substantial native tree and hedgerow planting will be established on the site. Large areas of open space will be maintained on the site, along with areas of wet and wildflower meadow.

The planting schemes shall ensure connectivity to linear/ woodland habitats in the wider landscape. Trees that are being retained at the site shall be protected during clearance and construction works in line with current guidelines e.g. British Standard 5837:2012 and National Roads Authority 2006a.

6.1.2 Lighting

To minimise disturbance to bats and other fauna that are active at night, construction operations during the hours of darkness will be kept to a minimum. In circumstances where, during the bat activity period (April to September), daylight hours stretch beyond the likely permitted hours of operation on site, there will be no requirement for lighting to be used on the site during this period.

6.2 Operational Phase

6.2.1 Lighting

Lighting within the proposed development site shall be installed with sensitivity for local wildlife while still providing the necessary lighting for human usage. This is particularly important for bat foraging/commuting habitat at the edge of the Dromin Stream and retained hedgerows, treelines and woodland habitats at the site.

The following general principles, which accord with the relevant verified measures set out in the BCT Lighting Guidelines (BCT, 2018), shall be implemented: -

- Lighting design shall fully consider the presence of protected species. Therefore, appropriate lighting shall be used within the proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas.
- Dark buffer zones shall be used to separate habitats or features from lighting by forming a dark perimeter around them. This shall be used for habitat features noted as foraging areas for bats.
- Buffer zones will be used to protect dark buffer zones and shall ensure that light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance

5 Impact Assessment

5.1 Construction Phase

This section details the principal potential impacts of the proposed SHD development during the construction phase, in the absence of mitigation.

5.1.1 Loss of Roosting Habitat

Roosting opportunities at the site are limited to 4 trees in the field boundaries that support potential roosting features such as cracks in limbs. No works are proposed to these potential tree roosts, therefore there will be no loss of roosting habitat within the site.

While it is likely that a Leisler's bat roost is present within one of the houses to the north-east of the site, this will not be impacted by the proposed works.

5.1.2 Loss of Foraging and Commuting Habitat

The results of the bat activity survey undertaken for the proposed development indicate that the site supports seven species of foraging and commuting bat (soprano pipistrelle, common pipistrelle, Leisler's, natterer's, whiskered, Daubenton's and brown long-eared bat).

The proposed clearance works will result in the removal of wet grassland, a portion of mixed (broadleaved) woodland and wet willow woodland and a hedgerow along the R617. These habitats provide foraging and commuting habitat for bats. As noted, no trees identified as potential roost sites are to be removed. The alteration and removal of this habitat would have a significant adverse impact to bat species (at a local geographic scale). This impact is mitigated by the proposed landscaping design (see Section 6) and the abundance of similar habitat beyond the proposed site, therefore, this project will have a slight temporary adverse impact to local bat species due to permanent local habitat loss of hedgerows onsite.

5.1.3 Lighting

Studies have found that Leisler's bat and pipistrelle bats can congregate around white mercury street lights and white metal halide lamps feeding on the insects attracted to the light. However, lighting can cause avoidance of an area for commuting bats and can prevent or reduce foraging for some species, including *Myotis* species⁵. Further, even bat species that have been shown to opportunistically forage in lit conditions have subsequently been recorded being impacted by artificial lighting. In cities, for example, common pipistrelles have been recorded avoiding gaps that are well lit, thereby creating a barrier effect⁶. Temporary lighting required during the construction phase may cause disturbance to bats commuting through or feeding at the proposed site. In the absence of mitigation, disturbance of bats due to construction phase lighting would have a temporary to short-term significant adverse impact at the local geographic scale.

5.2 Operational Phase

This section details the principle potential impacts of the proposed residential and retail development during the operational phase, in the absence of mitigation.

5.2.1 Lighting

The street and domestic lighting proposed for the development will increase light levels within the proposed development area. As noted in Section 5.1.2, increased lighting may reduce the availability

⁵ Stone E.L. (2013) Bats and Lighting: Overview of current evidence and mitigation.

⁶ Bat Conservation Trust and Institute of Lighting Professionals (2018) Guidance Note 08/18: Bats and artificial lighting in the UK. ILP, Rugby

limit radiating away from the feature or habitat that requires to be protected, as further outlined below.

Luminaire design is extremely important to achieve an appropriate lighting regime. In order to mitigate any potential impacts on bats from lighting, the following verified mitigation measures will be implemented, as set out in the most recent BCT Lighting Guidelines (BCT, 2018).

- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins is recommended to reduce the blue light component of the LED spectrum).
- Luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- The use of specialist bollard or low-level downward directional luminaires shall be implemented in bat sensitive areas to retain darkness above.
- Column heights shall minimise light spill. The shortest column height allowed shall be used where practicable.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will always be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct light only to where it is needed.

6.3 Enhancement

The following recommendations for enhancement are adapted from *Landscape and Urban Design for Bats and Biodiversity* (BCT, 2012). To attract nocturnal flying insects, the following planting shall be implemented:

- Mixtures of flowering plants, trees (including fruit trees) and shrubs to encourage a diversity of insects to sustain bats and other wildlife throughout the year. All new planting shall include pollinator friendly tree species including locally appropriate species listed in the Pollinator Friendly Planting Code⁷. Replacement and new hedgerows shall include a range of different species to provide food throughout the year, for example willows and blackthorn for early season nectar; hawthorn, bramble and rose for summer flowers and autumn berries; ivy for autumn nectar and later winter berries;
- Flowers that vary in colour, fragrance, shape, amount of nectar and time of flowering;
- Pale flowers that are more easily seen in poor light, so attracting insects at dusk;
- Single flowers, which tend to produce more nectar than double varieties; and
- Flowers with insect-friendly landing platforms and short florets, like those in the daisy or carrot families.

Other enhancement options include:

- Integrated bat boxes built into the structure of buildings (with the majority located on southern orientations)
- SUDs features, such as rain gardens

⁷ National Biodiversity Data Centre (2021) Pollinator Friendly Planting Code. All-Ireland Pollinator Plan 2021-2025. www.biodiversityireland.ie/pollinator-plan.

7 Residual Impacts

With the effective implementation of the mitigation measures outlined in Section 6, such as landscaping and the avoidance of use of lights during the construction phase during the months of April to September, as well as the minimisation of artificial light spill during the operational phase of the development, there will not be any significant negative effects on the conservation status of bat species from the proposed Cloghroe SHD.

8 References

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DATE: 16 June 2021
 DESIGNER: Fiachra O' Sullivan
 PROJECT No: 19083HD
 PROJECT NAME: Residential Development, Cloghroe, Cork



Lighting Classification
 Grid 1: Main Estate Roads - P3
 Grid 2: R617 - C3
 Grid 3: Retail & Creche - C4
 Grid 4: Minor Estate Roads, Apartments & Amenity Areas - P4

Outdoor Lighting Report

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Grid 1	557179.41	574495.48	288.47	381.86	1.49	1.53
2	Grid 2	557417.40	574383.02	79.18	357.53	1.58	1.55
3	Grid 3	557351.42	574417.98	93.48	73.29	1.48	1.50
4	Grid 4	557075.17	574503.06	425.40	463.54	1.70	1.85

Luminaires

Luminaire A Data

Supplier	
Type	BGP623 DW50
Lamp(s)	LED-HB 5S/740
Lamp Flux (klm)	13.50
File Name	Luma1_BGP623_DW50_13500_80LED_306mA_5S_CLO_L90_NW.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	595.5, 51.0, 0.0
No. in Project	15

Luminaire B Data

Supplier	
Type	BGP623 DX10
Lamp(s)	LED-HB 5S/740
Lamp Flux (klm)	12.00
File Name	Luma1_BGP623_DX10_12000_80LED_271mA_5S_CLO_L90_NW.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	522.9, 97.5, 0.0
No. in Project	6

Luminaire C Data

Supplier	
Type	BGP702 DM50
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	3.80
File Name	Luma Gen2 Micro_BGP702_DM50_3800_20LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	921.3, 65.9, 0.0
No. in Project	53

Luminaire D Data

Supplier	
Type	BGP701 DRXN0
Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	2.00
File Name	Luma Gen2 Nano_BGP701_DRXN0_2000_10LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	1419.1, 20.0, 0.0
No. in Project	24

Luminaire E Data

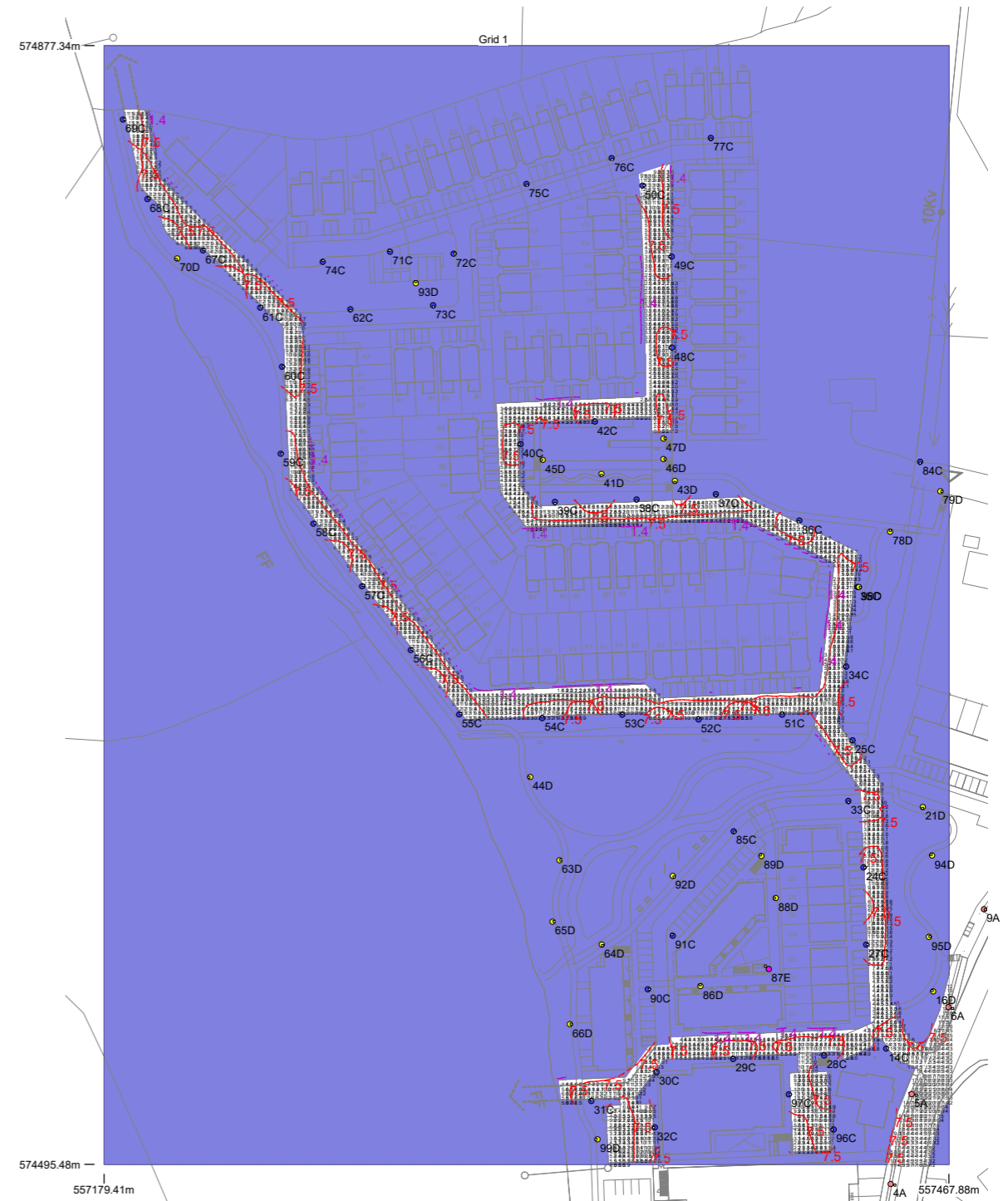
Supplier	
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Lamp(s)	LED-HB 5.2S 730
Lamp Flux (klm)	2.00
File Name	Luma Gen2 Nano_BGP701_DX50_2000_10LED_5.2S_CLO_L90_730.ies
Maintenance Factor	0.85
Imax70,80,90(cd/klm)	563.2, 53.2, 0.0
No. in Project	1

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
73	C	557291.77	574788.69	6.00	274.00	0.00	0.00	0.50			
74	C	557254.09	574803.49	6.00	89.00	5.00	0.00	0.50			
75	C	557323.59	574830.14	6.00	289.00	5.00	0.00	0.50			
76	C	557352.62	574838.94	6.00	294.00	0.00	0.00	0.50			
77	C	557386.49	574845.86	6.00	270.00	0.00	0.00	0.50			
78	D	557447.70	574711.43	6.00	81.00	0.00	0.00	0.50			
79	D	557464.91	574725.21	6.00	352.00	0.00	0.00	0.50			
80	C	557547.18	574711.78	6.00	261.00	5.00	0.00	0.50			
81	C	557530.52	574719.59	6.00	262.00	5.00	0.00	0.50			
82	C	557508.64	574725.22	6.00	258.00	5.00	0.00	0.50			
83	C	557482.98	574731.32	6.00	255.00	5.00	0.00	0.50			
84	C	557458.02	574735.36	6.00	261.00	5.00	0.00	0.50			
85	C	557394.35	574609.25	6.00	316.00	5.00	0.00	0.50			
86	D	557382.95	574556.32	6.00	92.00	0.00	0.00	0.50			
87	E	557406.32	574562.22	6.00	140.00	0.00	0.00	1.50			
88	D	557408.72	574586.43	6.00	180.00	0.00	0.00	0.50			
89	D	557403.80	574600.76	6.00	136.00	0.00	0.00	0.50			
90	C	557365.03	574555.29	6.00	2.00	0.00	0.00	0.50			
91	C	557373.56	574573.54	6.00	129.00	5.00	0.00	0.50			
92	D	557373.57	574593.93	6.00	321.00	0.00	0.00	0.50			
93	D	557285.83	574796.29	6.00	94.00	0.00	0.00	0.50			
94	D	557462.10	574600.99	6.00	138.00	0.00	0.00	0.50			
95	D	557460.95	574573.13	6.00	29.00	0.00	0.00	0.50			
96	C	557428.44	574507.39	6.00	184.00	0.00	0.00	0.50			
97	C	557413.16	574519.37	6.00	5.00	0.00	0.00	0.50			
98	D	557437.09	574692.55	6.00	346.00	0.00	0.00	0.50			
99	D	557347.84	574504.06	6.00	182.00	0.00	0.00	0.50			

Horizontal Illuminance (lux)

Grid 1

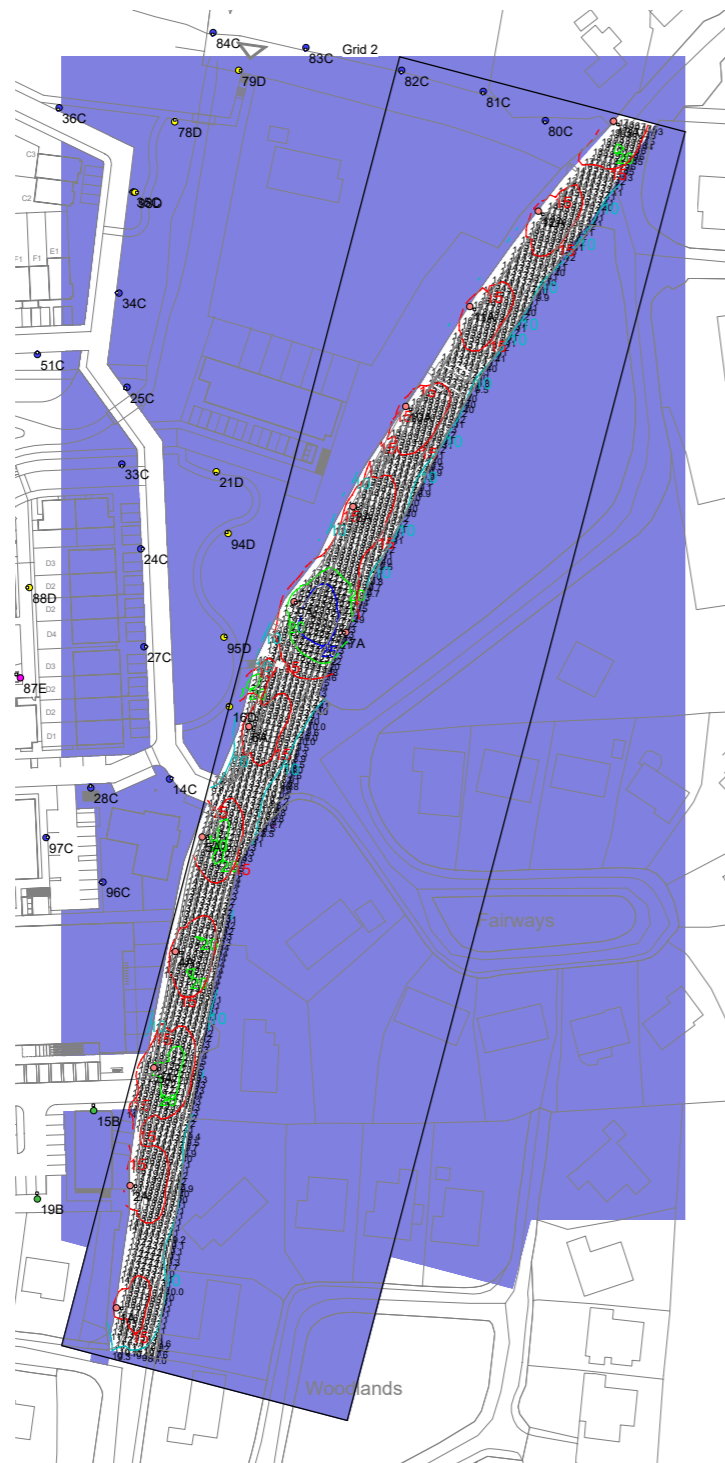


Results

Eav	8.24
Emin	1.65
Emax	23.27
Emin/Emax	0.07
Emin/Eav	0.20

Horizontal Illuminance (lux)

Grid 2

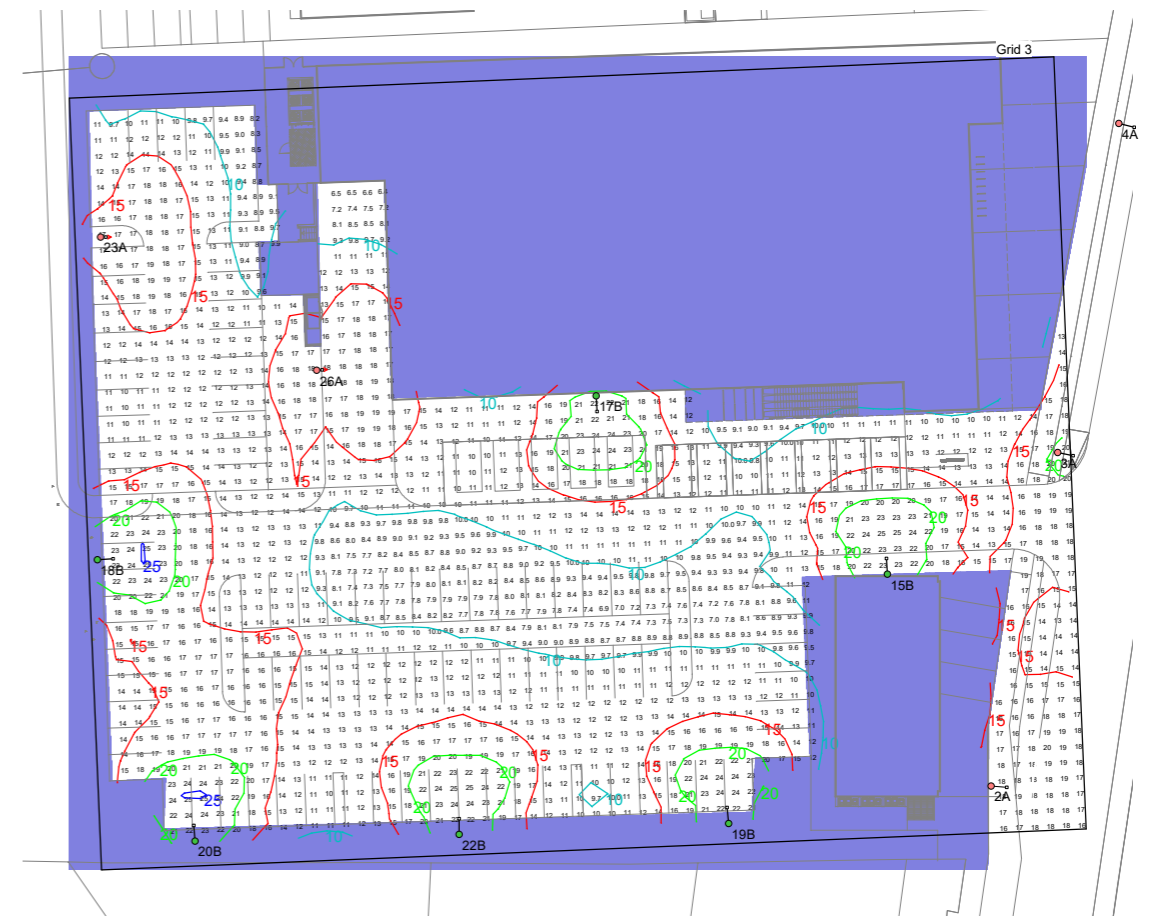


Results

Eav	15.55
Emin	6.70
E _{max}	30.79
E _{min} /E _{max}	0.22
E _{min} /E _{av}	0.43

Horizontal Illuminance (lux)

Grid 3

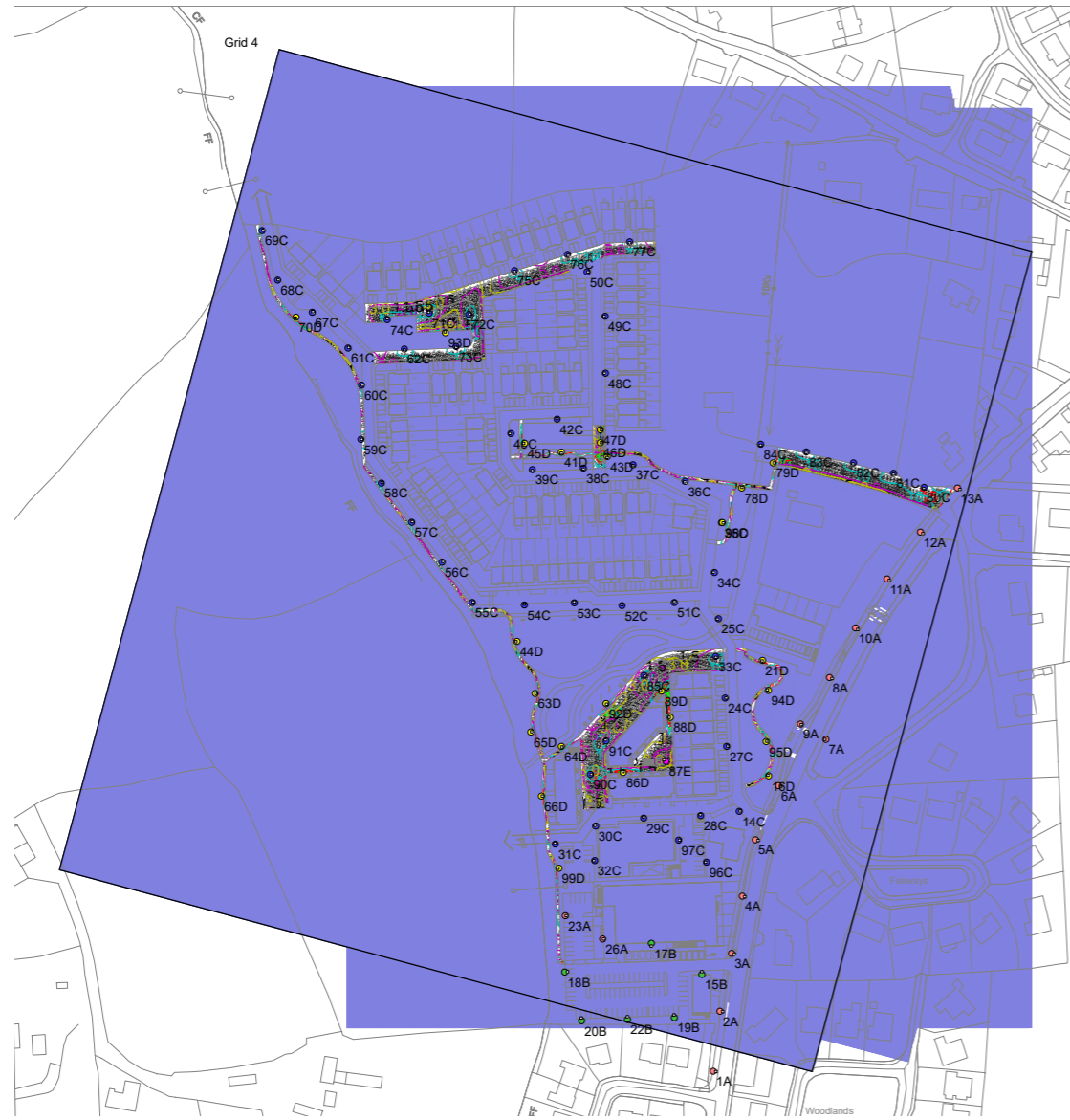


Results

Eav	13.97
Emin	6.39
E _{max}	25.37
E _{min} /E _{max}	0.25
E _{min} /E _{av}	0.46

Horizontal Illuminance (lux)

Grid 4



Results

Eav	7.16
Emin	1.40
Emax	36.46
Emin/Emax	0.04
Emin/Eav	0.20

Proposed Cloghroe SHD, Tower, Co. Cork

Natura Impact Statement

Cloghroe Development Limited

30 November 2021

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1. Introduction

1.1. Background

Cloghroe Development Limited is applying for permission for a strategic housing development, and all associated ancillary development works including the completion of a foul and storm water drainage, boundary treatments, landscaping and amenity areas in Cloghroe, north of Cork City. The 7.5ha site is proposed to comprise a mixed development of residential units, café, food store and crèche.

Atkins have been appointed by HWP to undertake Appropriate Assessment screening and to prepare a Natura Statement for the proposed development.

1.2. Project Location

The proposed site is located close to Cloghroe, Tower approximately 10km northwest of Cork City centre. It is accessed from the R617, which runs along the eastern side of the site. The proposed development is located within the Settlement Boundary of Tower as identified in the Blarney/Macroom Municipal District Local Area Plan adopted in 2017. Tower is identified within this LAP as a Key Village. As per the Cork City Council Boundary Extension 2019, the site location is now included within the new Cork City Boundary.

The site is 7.5ha in area. It is bordered to the south by Senandale Housing estate, with housing also located to the southwest and to the north. The area surrounding the site is primarily agricultural in character, with the lands immediately to the north and west being in agricultural use (improved agricultural grassland). A number of housing estates are also located to the west of the site on the eastern side of the R617; beyond which lies Muskerry Golf Club. The village of Tower lies to the northeast along the R617.

A small land drain flows through the centre of the site. This joins the first order Dromin Stream which runs in a southerly direction along the western boundary of the site (labelled Dromin_19 on EPA Maps¹). The Dromin Stream enters the Owennagearagh River 180m downstream of the site (labelled the Currabeha River on EPA Maps), which in turn enters the Shournagh River approximately 1km to the east of the site. The River Shournagh is in turn a tributary of the River Lee, which it joins at Leemount Bridge, Carrigrohane. The Water Framework Directive (WFD) status of the Dromin Stream and Owennagearagh River is defined as Moderate (River Waterbody WFD Status 2013-2018); both watercourses are identified as "At Risk"; as is the Shournagh downstream of the site.

Figure 1.1 displays the location of the proposed site.

¹ <https://gis.epa.ie/EPAMaps/>

1.2.1. Understanding the Site Character

Aerial photos and site maps assisted the ecological walkover survey. The location of the proposed project and the surrounding areas were viewed using Google Earth, Google maps and Bing maps. The EPA online mapviewer OSI Discovery series maps were used to locate watercourse networks and identify hydrological connectivity to larger rivers such as the River Shournagh or the River Lee.

An ecological walkover survey of the site was conducted by an Atkins ecologist on the 23rd October 2020 and 25th August 2021. The purpose of the survey was to characterise and record the habitats and sensitive ecological receptors within and adjacent to the channels included in the study area. The site was visited on the 12th and 26th November 2020 to undertake terrestrial mammal survey work. Bat survey work was undertaken on site in May 2021 and September 2021. The river adjoining the site was also walked in September 2021 to check for signs of Otter (*Lutra lutra*).

A Phase 1 habitat survey was undertaken in line with published practice (Smith *et al.*, 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the Botanical Society of Britain and Ireland's List of Accepted Plant Names (Botanical Society of Britain and Ireland, 2007). Habitats were later mapped using MapInfo v16 GIS software.

Incidental sightings and signs of birds, mammals, invertebrates and amphibians were noted during the walkover survey to further evaluate the importance of the site to flora and fauna (in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and *Guidelines for Ecological Impact Assessment* (CIEEM, 2018). Trail camera surveys to examine the possibility that a number of burrows might be used by badger was undertaken in November 2021.

The landscape value for bats was also considered (after e.g. Entwistle *et al.*, 2001; etc.). Bat survey work was undertaken by Greenleaf Ecology on behalf of Atkins. Walkover surveys of areas identified as potential roosting, foraging and commuting habitats during the desk top study were undertaken in May and September 2021. Potential bat habitat was assessed using the criteria outlined in Table 2.1 of the Bat Report (refer to Appendix 9.1 of the accompanying EIAR). A detailed inspection of potential bat roosting sites (both trees and structures) was undertaken in both May and September 2021. An assessment of bat activity was also undertaken. A total of 3 dusk activity surveys were completed and were undertaken on 10th May, 17th May and 27th September 2021. Each survey was conducted in appropriate weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below (10°C).

In order to supplement the information gathered from the manual activity surveys, a passive monitoring system of bat detection was also deployed for this survey scheme (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). Passive monitoring was completed in May 2021 and September 2021 using the Anabat Express and Anabat Swift bat monitors. Weather conditions were mixed during the monitoring, with spells of heavy rain and low temperatures at night. One Anabat Express monitor and two Anabat Swift monitors were deployed for the survey and were positioned in hedgerows at three different locations. The passive monitors recorded between 10/05/2021 and 14/05/2021 and 22/09/2021 and 26/09/2021 (inclusive).

The findings of these surveys are set out in full in Section 4.2, below. However, the findings can be summarised as follows. There are no habitats within the development site of greater than local value. No ecological features of regional, national or European importance will be impacted by the proposed development. This site is dominated by improved (GA1) and wet grassland (WS4) and includes an area of Built land (BL3). The site is bordered by treelines (WL2) and hedgerows (WL2) and includes examples of mature oak trees on the western side of the site. Other semi-natural habitats recorded include mixed broadleaved woodland (WD1); wet willow woodland (WN6) and scrub (WS1). An area of grassy verges (GS2) is present along the R617 verge adjoining, but outside the site. Apart from a central drain (FW4), there are no watercourses within the development site. The Dromin stream (FW1) runs along the western boundary of the site. No rare or protected plant species were recorded on site. No invasive plant listed on the Third Schedule to the European Communities (Birds and Natural Habitats Regulations (S.I. 477 of 2011) were recorded on site. Overall, the proposed development site is considered to be of high suitability for foraging and commuting bats due to the presence of connectivity to other suitable habitats in the wider landscape. While a number of potential bat roosts (trees) were identified, none of these trees will be removed. Moreover,, in the main, treelines and hedges framing the site will be retained and

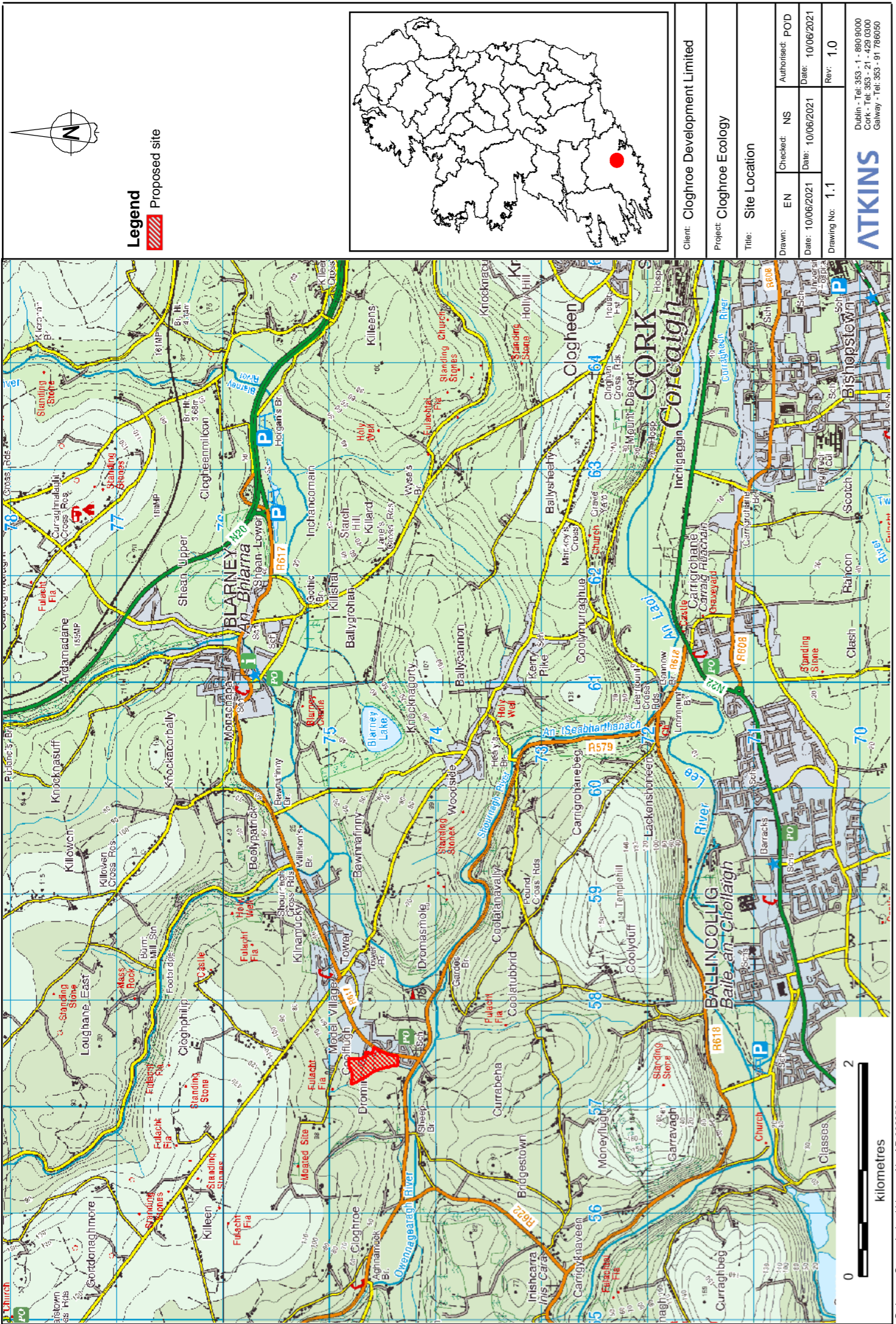
will not be impacted. No badger setts were recorded on site. No signs of otter were recorded on the Dromin Stream; movement along the stream corridor is negatively affected by culverting of the river downstream of the site. Common frog was encountered in the wet grassland at the southern end of the site. A bird community typical of the habitats on site and of local importance (higher value) was noted.

1.3. Project Description

Development consent is sought for the proposed Cloghroe SHD, which comprises the following principal components: -

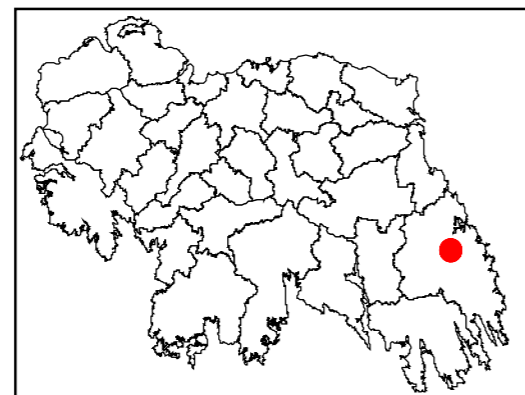
- Construction of 198 residential units, a 42-child creche, a retail food store, a café, and associated green space.
- Demolition of 2 agricultural structures to the north of site (382 m²).
- On site vehicle streets with associated car parking provision.
- On site dedicated car park for retail unit.
- A mix of independent pedestrian and cyclist infrastructure together with shared street spaces
- Drainage and water supply infrastructure to accommodate the residential and commercial aspects of the site.
- Lighting, power and communications infrastructure to accommodate the residential and commercial aspects of the site.
- Public realm upgrades on R617 Blarney Road including footpath, cycle lane, signalised crossing, and relocation of existing bus stop.
- Flood defence works including flood storage provision.

The proposed site layout which the subject of this planning application in included in Figure 1.2 (see also accompanying Planning Pack for a full set of Drawings).



Legend

Proposed site



Client:	Cloghroe Development Limited		
Project:	Cloghroe Ecology		
Title:	Site Location		
Drawn:	EN	Checked:	NS
Date:	10/06/2021	Date:	10/06/2021
Authorised:	POD	Date:	10/06/2021
Drawing No:	1.1	Rev:	1.0



Dublin - Tel: 353 - 1 - 890 9000
 Cork - Tel: 353 - 21 - 429 0300
 Galway - Tel: 353 - 91 786050



Site boundary

198no residential units, 42no child crèche, retail food store + cafe

Figure 1.2 Proposed Site Layout.

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1.4. Specific Site Details

The application site, which is currently greenfield, is located within the Settlement Boundary of Tower as identified in the Blarney/Macroom Municipal District Local Area Plan adopted in 2017. Per the Cork City Council Boundary Extension 2019, the site location is now included within the Cork City Boundary. The site is located on the R617 Blarney Road in the village of Cloghroe. The site is bounded to the east by the R617 and to the south by the residential estate of Senandale.

The site is situated on a north to south slope which slopes more steeply to the north of the site and more gently to the south. A stream flows in a southerly direction along the western boundary of the site with a land drain extending the southern boundary draining to the stream. The design involves the building up of the southern part of the site via fill to remove the flood risk from the stream impacting the development. A flood storage system is included in the proposed works. A balanced cut/fill approach was taken for the northern part of the site to minimise the need for any excavated material to be taken offsite during the works. Detailed cut/fill quantities have been provided for the scheme and are included in the accompanying Engineering Design Report. Preliminary Site investigation has been carried out to determine the reusability of excavated earthworks materials, groundwater profiles and seepage from cut areas on the site. This information has been used to inform an earthworks management plan details of which are included in the Construction and Environmental Management Plan (MHL, 2021b).

As outlined in the CEMP, an Environmental Manager is to be appointed, whose role is to Ensure that the CEMP is developed, implemented and maintained. Key responsibilities include: -

- Implementing the Environmental Procedures of the CEMP and updating it as necessary.
- Management of all Environmental aspects of the Construction Works and Audit of Controls.
- Review and Approval of Method Statements relating to Environmental aspects.
- Ensuring Implementation of Mitigation Measures.
- Training of Staff in all Environmental issues.
- Liaison with Construction Manager.

Furthermore, a Project Ecologist is to be employed; they will report to the Environmental Officer and will be responsible for advising on all ecological monitoring activities. The responsibilities and duties of the Project Ecologist will include the following: -

- Ensure effective monitoring.
- Ensure effective implementation of any measures required as set out in the CEMP.
- In addition, the Contractor will outline key Environmental Performance Indicators and implement a system for dealing with environmental incidents / complaints. This is addressed in the CEMP (MHL, 2021b).
- The project is supported by a full planning pack which includes, design drawing and supporting reports, all of which helped to inform this assessment: -
- Deady Gahan (2021a). Coolflugh, Cloghroe, Tower, Cork Universal Design Statement Proposed Mixed Use Development at Coolflugh, Cloghroe, Tower, Cork. For Cloghroe Development Ltd.
- Deady Gahan (2021b). Coolflugh, Cloghroe, Tower, Cork Housing Quality Assessment Proposed Mixed Use Development at Coolflugh, Cloghroe, Tower, Cork. For Cloghroe Development Ltd.

- Forestbird Design (2021). Public Realm and Landscape Proposals. Proposed mixed-use development Cloghroe, Coolflugh, Tower, Cork. For Cloghroe Development Ltd.
- Irish Hydrodata Ltd. (2021). Site Development at Coolflugh, Tower, Blarney, Co. Cork. Flood Risk Assessment Report. Report prepared for Cloghroe Development Limited.
- MHL & Associates (2021a). Engineering Design Report. Cloghroe Development, County Cork. Report prepared for Cloghroe Development Ltd.
- MHL (2021b). Cloghroe Development, County Cork. Construction and Environmental Management Plan². Report prepared for Cloghroe Development Ltd.
- MHL (2021c). Lighting Reality Pro Outdoor Lighting Report. Report prepared for Cloghroe Development Limited.

1.4.1. Phasing of the Work

The proposed application is for the delivery of 198 residential units, a 42-child creche, a retail food store, and café with apartments. A scheme plan showing the three proposed phases as well as the location of the proposed compound and the main construction access from R617 Blarney Road is shown in Figure 1.3. The expected duration of the proposed works will be approximately 4 years.

It is proposed to develop the site in three phases: -

- Phase 1: Bulk excavation across the entire site extents, to take approximately 6 months to complete (site boundary noted in red in Figure 1.3).
- Phase 2: 82 Units including the proposed creche, retail food store and café in the South of the site, to take approximately 18 months to complete (noted in pink in Figure 1.3).
- Phase 3: 109 Units in the North of the site, to take approximately 24 months to complete (noted in green in Figure 1.3).

² This report includes the projects Preliminary Construction and Demolition Waste Management Plan.

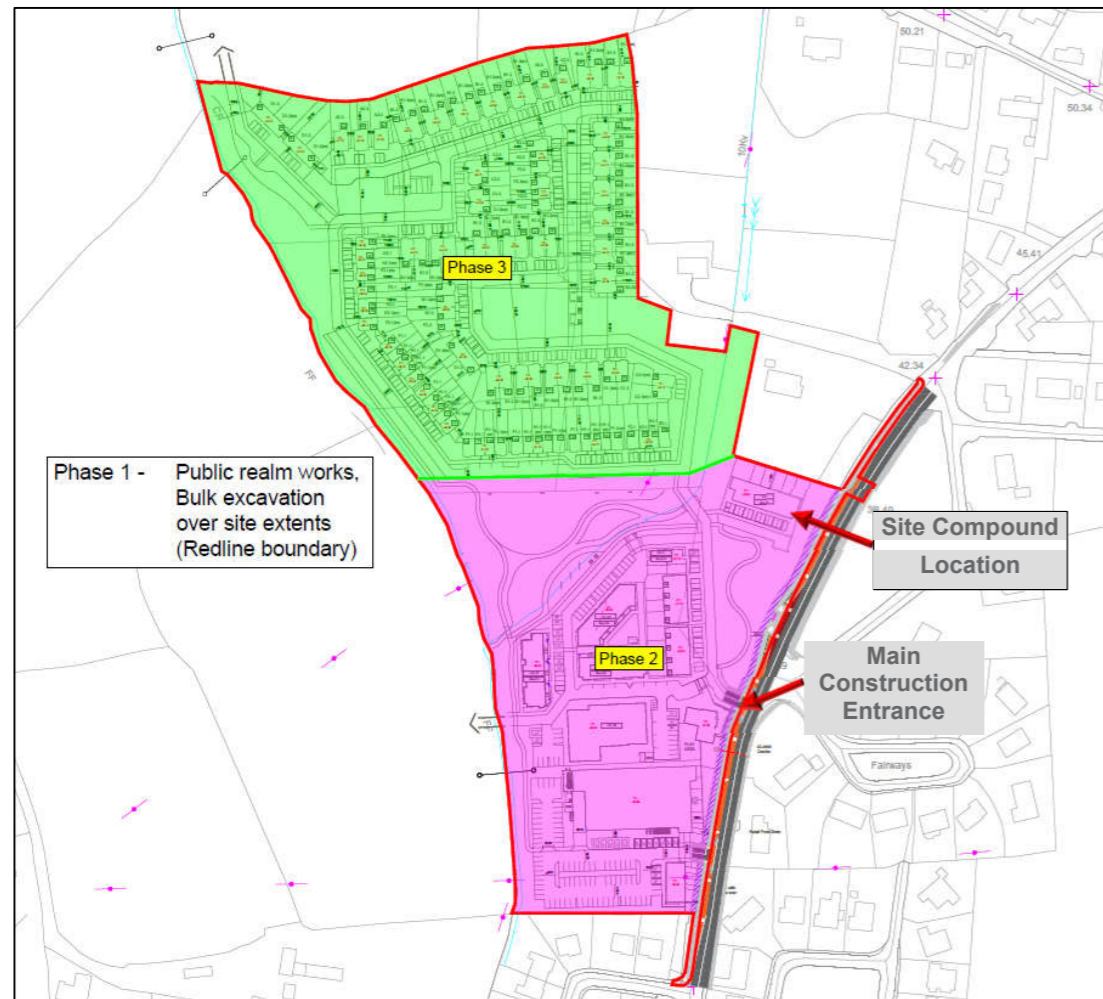


Figure 1.3 Phasing Diagram.

1.4.2. Control of Surface Water Runoff

The control measures relating to surface water run-off during the **construction phase** of the development shall follow best practice as recommended by CIRA 2010 and ISO 14001:2015 – Environmental Management Systems and C741 Environmental good practice on site guide (4th edition) and CIRIA (2015) Coastal and marine environmental site guide (second edition) (C744).

Measures to be implemented will consist of: -

- Surface water shall be directed to settlement ponds where topographically feasible. Where this is not practicable, the surface water shall be allowed to percolate to ground and/or be removed by tanker to a designated waste-water treatment plant if excessive build-up of surface water on site occurs.
- Protection of surface water gullies or drains using silt fences.
- Use of bund structures (including incorporating existing ditches) on site to retain surface waters on site and to prevent runoff from the site. Bunds will be made up of adequately compacted material and visibly inspected during site audits to ensure they remain intact and functional.
- Minimal and short-term storage and the removal of excess materials (soil, stones and construction wastes) off site in an efficient manner.
- Daily checks of surface water regime on site and logging of same.

- Works associated with excavations or earth moving not to be undertaken in periods of forecasted bad weather.
- Drainage channels beside construction roadways to direct surface water to settlement areas and allow for natural percolation to ground.
- Ensure good site management is maintained at all times during the construction phase including regular site clean-ups and use of appropriate bins.
- Chemicals or fuel/oils shall be stored in temporary bunded storage areas and plant is re-fuelled via delivery trucks in specific bunded re-fuelling areas, rather than the storage of large quantities of fuel on site in a designated bunded area. Bunds will be made up of adequately compacted material with impermeable membrane and visibly inspected during site audits to ensure they remain intact and functional. Straw mats shall also be implemented in the event of a spillage.
- The pouring of concrete, application of chemicals, painting or any other activity that has the possibility of being toxic to aquatic life shall be undertaken in a control and isolated manner, preventing the possibility of any pathway to a surface water source.

During **site operation** the proposed surface water drainage system is in accordance with Sustainable Urban Drainage Systems (SUDS) principles and divides the site into six (6) drainage catchments: all of which are proposed for attenuation utilising Stormtech Underground Chamber systems (shown in Blue, while this storage tank is shown in Green on Figure 1.4; from Irish Hydrodata Ltd., 2021). Each attenuation system is designed with a controlled flow rate of less than the greenfield run-off rate for the catchment area. This results in an overall discharge from the site of 20.8 l/s which is less than the greenfield run-off of 25.29 l/s. The attenuated systems will ultimately discharge into the Owennagearagh River via the public storm sewer present on the R617 (MHL, 2021a) downstream of the Currabeha bridge.

The pipe diameters of the storm sewer were calculated to provide adequate capacity for the development (pipe diameters along the network include 150mm, 225mm and 375mm). The minimum gradient in the development storm sewer network is 1/200. The maximum gradient in the development storm sewer network is 1/15 (MHL, 2021a).

The storm-runs generally flow in a south-easterly direction to the six proposed attenuation tanks. The design of the attenuation tanks was informed by the actual site greenfield run-off rate for each catchment using HR Wallingford Methodology IH124. However, in order to produce a robust design, the surface water run-off rate has been restricted further for each tank. Details of the attenuation tanks design and sizes are included in Table 5.2 of the Engineering Report (accompanying this application). Attenuation tanks have been designed for a storm return period of 1 in 100 year and with a 20% climate change factor.

One outfall is proposed from the surface water network to tie into the existing storm sewer running along R617 Blarney Rd. As stated previously in this section the development surface water will ultimately discharge into the Owennagearagh River to the east of the Currabeha Bridge. The proposed storm design greatly reduces the quantity of surface water from the development lands entering the stream running along the western boundary of the site.

Full details of the approach to surface water management systems on site are presented in Section 5.0 Storm Water Network of the Engineering Design Report (MHL, 2021a).

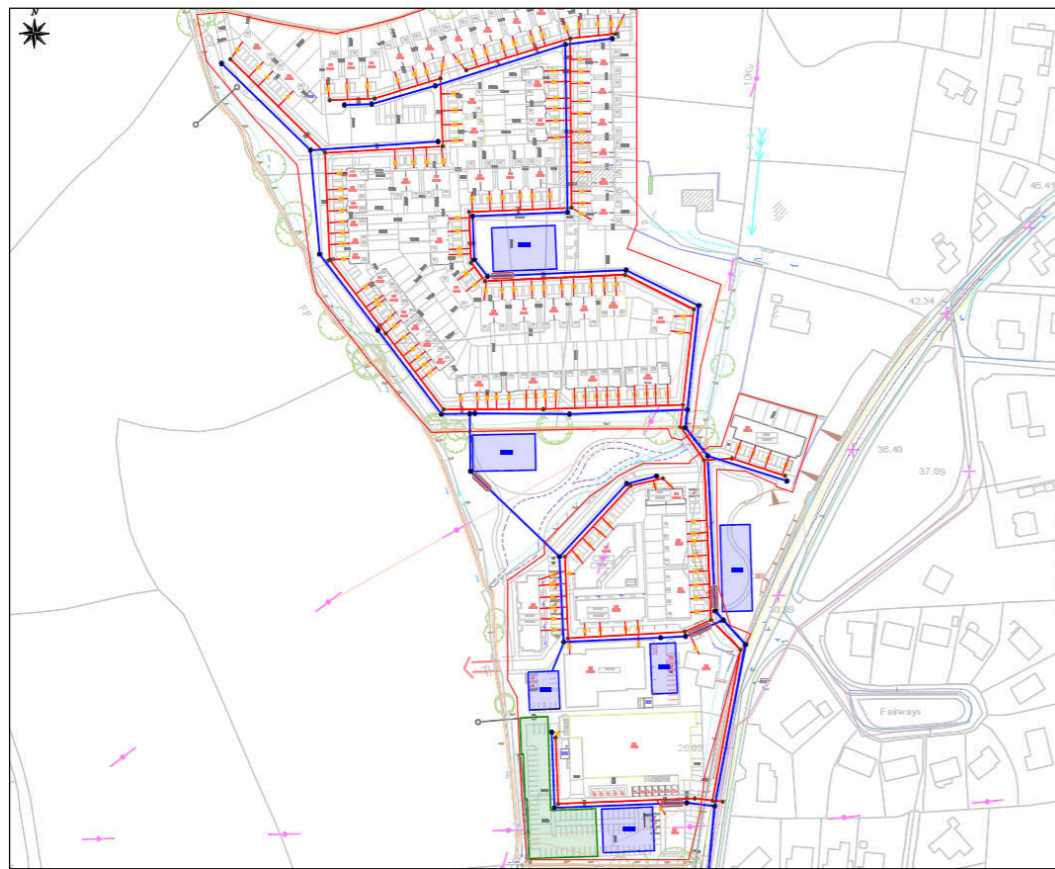


Figure 1.4 Proposed storm/foul lines, attenuation tank, and flood storage tank locations.

1.4.3. Foul Effluent

The construction of the foul sewer pipe network shall be in accordance with Irish Water Code of Practice for Wastewater Infrastructure Doc IW-CDS-5030-03. Full details of the approach to foul effluent on site are presented in Section 6.0 Foul Water Network of the Engineering Design Report (MHL, 2021a).

A pre-connection enquiry has been made to Irish Water. Based on the information provided, Irish Water confirmed that “we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time” (correspondence dated 16th October 2020).

Refer to Appendix A and B of the Engineering Design Report (MHL, 2021a) for Irish Water statement of design acceptance letter received (dated 16th and 29th of October 2020). With respect to foul effluent, upgrade works required to be undertaken by Irish Water at the Cloghroe Waste Water Pumping Station are limited to upgrading of the pump.

1.4.4. Potable Water

In relation to potable water connection sufficient capacity exists to service the proposed development. A 150mm diameter HDPE watermain is proposed to supply potable water to all units and fire hydrants within the development. The proposed pipe network has no dead ends with loops serving a minimum of 4 units in accordance with Irish Water Code of Practice for Water Infrastructure Doc IW-CDS-5020-03. The 150mm mains will be connected to the existing mainline present on R617 as agreed with Irish Water.

A Pre-Connection Enquiry Form has been submitted to Irish Water to progress connection details. The response from Irish Water is included in Appendix A of the accompanying Engineering Report.

1.4.5. Hours of Work

Works will occur within the hours: -

- 07.00am – 07.00pm* (Monday – Friday inclusive)
- 07.00am – 4.00pm* (Saturday)
- There will be no work on Sunday and Bank Holidays.

** It is proposed that exceptionally, and with prior agreement of the planning authority, working hours may be extended and/or works may take place on a Sunday and/or Bank Holiday at times when critical elements of work need to be advanced. Longer working days can occur when there is a planned concrete pour. If extended working hours are required, these will be agreed in advance with the planning authority. Accordingly, traffic generated by core construction personnel will be mainly during the off-peaks and will not have a significant adverse impact on the road network.*

1.4.6. Lighting

A separate public lighting design report is included as part of the application documentation. The public road lighting is designed to EN 13201 and British Standard BS 5489 utilising the “Lighting Reality Pro” software package. This design package is used to select an appropriate lantern type and to optimise the lighting design. The selected lantern is designed and manufactured to comply with EN 13201 with IP65 optic and 10 joules shock resistant gear housing. To meet with ecology requirements, in particular regarding potential bat activity, all installed lighting in the development will be Warm White (<3000K). Additionally, minor estate roads will receive a step down in lighting classification to P4 instead of P3.

The design and selection of lighting columns is included in the public lighting design report. In response to the ecology report, all estate lighting columns are 6m high instead of 8m (or 10m) on the public roads.

In addition to internal estate roads, it is proposed to install a new public lighting scheme along the extent of the works as part of proposed public realm improvements.

Mitigation measures integrated into the design to minimise impacts on bats using the site are discussed in the accompanying Biodiversity Chapter of the EIAR.

1.4.7. Flood Risk Assessment

Irish Hydrodata Limited (IHD) was commissioned to prepare a site specific flood risk assessment [SSFRA] for the proposed development. The completed assessment is included in a separate report submitted with the application documentation (Irish Hydrodata Ltd., 2021). Planning guidelines on flood risk and development have been published by the OPW and Department of Environment, Heritage and Local Government (DoEHLG). The flood risk assessment report summarises how the developments design was assessed in accordance with the main principles of the Guidelines. The findings of the assessment are set out in full in the accompanying SSFRA Report.

1.4.8. Construction Stage Methodology

Having regard to the scope of the site works and processes, a detailed scheme of works is described in the following sub-sections.

1.4.8.1. Pre-commencement Activities

Before works commences a number of preparatory activities will be carried out. The following key works will be undertaken as part of the site preparation and pre-development activities: -

- Prior to undertaking groundworks, a professional land surveyor shall be appointed to confirm existing ground levels shall be carried out with the consulting engineers.

1.4.8.2. Enabling Works

- The initial enabling works, to be carried out in accordance with the CEMP submitted with the planning application will enable the main access road off the R617 Blarney Road to facilitate construction access to the site.
- This will be followed by bulk excavation works to the north of the site. These works will include the creation of level platforms, accessible from the main access road, upon which the site compound and materials storage area will be constructed.
- Once the site compound is accessible, Tree Protection Fencing will be installed prior to other works commencing on site. Fencing will be installed at 2m offsets from hedgerows to be retained (drawing L103) and will remain in place for the duration of construction. Fence panels shall be open mesh to ensure continued light and air circulation, with 150mm ground clearance to ensure continued small fauna movement. All trees and other vegetation to be retained shall be clearly marked on site.

1.4.8.3. Temporary Site Compound

Once the main entrance is in place and the bulk excavation has reached the appropriate stage, the temporary construction facilities will be established (Figure 1.5).

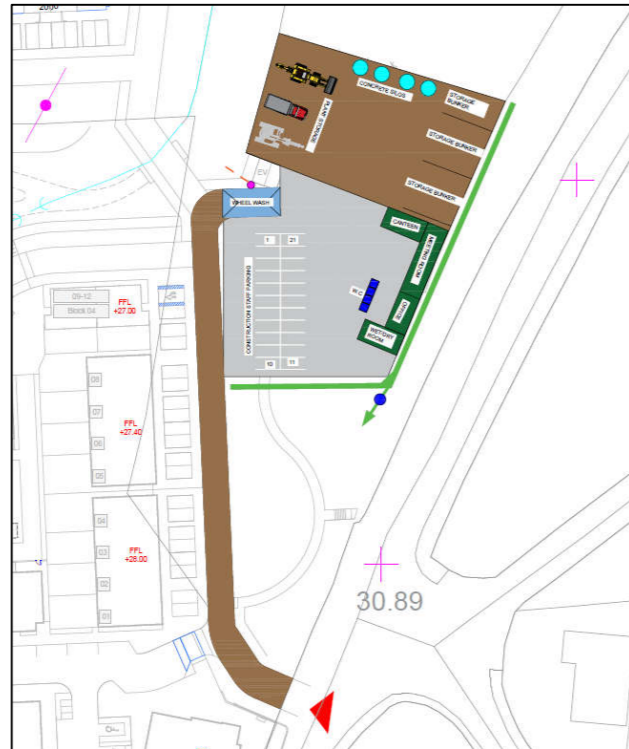


Figure 1.5 Site Compound Plan.

These will include: -

- Site offices, canteen and toilet / changing facilities c/w temporary water supplies and wastewater treatment unit.
- Secure compound and containers for storage of materials and plant.
- Temporary vehicle parking areas.
- Contained area for machinery refuelling and construction chemical storage.

- Contained area for washing out of concrete and mortar trucks.
- Wheel-washing facilities for vehicles leaving the site.

A security/heras fencing will be provided at the main R617 Blarney Rd. entrance. All vehicles and personnel will be checked on entry to ensure no unauthorized access or fly-tipping will occur within the site. Heras fencing will also be provided on all boundaries to adjoining lands.

Water supply for the construction facilities will be taken from the mains supply which is adjacent the site. Power for the pumps and small power requirements for construction activities will be supplied from diesel generators until such time as the permanent site power supply is available.

1.4.8.4. Phased Based Construction

The following processes will be repeated for each phase of development and will be carried out in accordance with the requirements of the adopted CEMP.

Bulk Excavation

- The total volume of soil requiring excavation for the proposed development is expected to be ca. 13,200m³; this includes topsoil which is not usable as fill. Where possible topsoil will be reused onsite for landscaping purposes. Excavated subsoil where suitable will be reused onsite; this amounts to 9,700m³. Allowing for a fill quantity of 34,300m³, it means that a quantity of 24,600m³ will be required for import.
- Unsuitable soil cannot be discounted and may require disposal offsite. All such material will be tested prior to being removed and recovered or disposed of offsite to a suitably permitted / licenced waste recovery / disposal facility in accordance with relevant waste management legislation (including but not limited to the Waste Management Acts and regulations made thereunder).
- No soil will be stripped within 5m of the edge of stream. Given the history of pasture use, soil will be stripped to 350mm depth and stored as topsoil in stockpiles of no greater than 2m height, to ensure long term storage soil fertility. Soil excavated at depths greater than 350mm will be stored separately as subsoil (i.e. 9,700m³).
- Following the topsoil strip of phase 1 (13,200m³), the main access road serving the development will be constructed to formation level. The bulk excavation work across the site will then be undertaken. Excavation undertaken to the north of the site will generate structural fill for the grading of the southern housing/commercial platforms. Any excess fill material generated will be stored locally to be used in later stages of development. All subsoil excavated to be treated as necessary for reuse as structural fill (ca. 9700m³).
- Having established the desired site levels during the early works, the next phase of construction will involve the digging of the foundations for each of the buildings. The civil and structural design for each building will determine the location and extent of foundations that are required to support each of the buildings. The foundations for each building will be excavated to the desired size and depth in preparation for the pouring of concrete. Following site investigation works undertaken, it is noted that bearing capacity varies across the site. In general, sufficient bearing capacity for foundations between 1.2m to 3m depths in the northern part of the site. The southern part of the site will require piling for bearing to depths between 6m and 9m.

Civil Works

- The initial civil concrete works will involve the pouring of the foundations for each of the prepared buildings in this phase. Once the foundations are poured and have cured it will allow the building envelope to be erected.
- It is proposed that a concrete block construction process will be used which will involve the delivery of blockwork to site followed by external finishing material such as brickwork, plaster, and roof tiles.
- Construction materials will be sourced locally where practicable.
- Works on external services including water mains, foul sewers, storm sewers, roads, footpaths and public lighting will be carried out in conjunction with the completion of the units.
- All buildings will be constructed in accordance with current Building Regulations and certified by an appropriated qualified engineer during and after construction.

Landscaping

- In tandem with the other construction activities being carried out on the buildings, elements of the site's landscaping plan will be progressed. The formation of landscape features will take place in parallel to the early works, utilising material excavated during the cut and fill exercise. As the site build progresses the landscape works will begin to focus on the soft landscaping aspects such as establishment of green zones and walkways, as well as planting of trees and shrubs in designated areas.
- Peripheral planting will be installed during the first planting season to ensure boundary interfaces are as robust as possible upon occupation.
- No herbicides will be used in the landscape preparation of the public open spaces, to minimise impact on natural drainage systems. The only use of herbicides will be in the private rear gardens prior to amenity grass installation.

Control of Surface Water Run-off

The control measures relating to surface water run-off during the construction phase of the development shall follow best practice as recommended by CIRA 2010 and ISO 14001:2015 – Environmental Management Systems and C741 Environmental good practice on site guide (4th Edition) and CIRIA (2015) Coastal and marine environmental site guide (second edition) (C744).

Measures to be implemented will include the following: -

- Surface water shall be directed to settlement ponds where topographically feasible. Where this is not practicable, the surface water shall be allowed to percolate to ground and/or be removed by tanker to a designated waste-water treatment plant if excessive build-up of surface water on site occurs.
- Protection of surface water gullies or drains using silt fences.
- Use on-site bund structures (including incorporating existing ditches) on site to retain surface waters on site and to prevent runoff from the site.
- Minimal and short-term storage and the removal of excess materials (soil, stones and construction wastes) off site in an efficient manner.
- Daily checks of surface water regime on site and logging of same.
- Works associated with excavations or earth moving shall not be undertaken in periods of forecasted bad weather.

- Drainage channels beside construction roadways to direct surface water to settlement areas and allow for natural percolation to ground.
- Ensure good site management is maintained at all times during the construction phase including regular site clean-ups and use of appropriate bins.
- Chemicals or fuel/oils shall be stored in temporary bunded storage areas and plant is re-fuelled via delivery trucks in specific bunded re-fuelling areas, rather than the storage of large quantities of fuel on site in a designated bunded area.
- The pouring of concrete, application of chemicals, painting or any other activity that has the possibility of being toxic to aquatic life shall be undertaken in a control and isolated manner, preventing the possibility of any pathway to a surface water source.

Site Storage

Materials for inclusion as part of the works will be stored generally within the allocated compound. No products will be placed outside of this area. Materials will be brought to site periodically to suit the programme for the works.

Earthworks arising will be stored within the identified space and will be sampled, processed and placed within the works or removed off site in accordance with the Waste Management Plan (refer to Section 4 of the CEMP; MHL, 2021b).

Construction Access

Construction Access to the site will be from the R617 Blarney Road via the proposed main access road serving the site.

The main access road will be excavated to formation level and constructed to basecourse level which will be temporarily surface dressed subject to the completion of overall development. The main surface water drainage in this area will also be provided as part of the initial enabling works.

Equipment

Equipment to be used on site is as shown in Table 1.1 (extracted from the CEMP. MHL, 2021b).

Table 1.1 List of typical plant required for this Project.

Plant Item	Purpose
Hydraulic excavators – various	Excavation, substructures, drainage
Mobile cranes - various	Erection of buildings, movement of large materials and plant
Dumpers	Excavations, drainage, landscaping, movement of materials
Concrete saw cutting	Used for cutting concrete slabs in yard areas, building substructure and superstructures
Volvo dump trucks	Removal of demolition materials off site
Ready-mix concrete trucks	Delivery of concrete to site for new structures, slabs etc.
Pump unit for ready-mix concrete	For placement of concrete
Vibrating rollers	Used for compacting stone in roads, yard areas, substructures etc.
HGV – 20 foot trailers	Delivery of materials, steel, cladding and concrete blocks.
HGV – 40 foot trailers	Delivery of structural steel, cladding, large elements of new plant and equipment

Plant Item	Purpose
Telescopic site handlers	Handling and moving materials on site
Road sweeping equipment	Management of dust and excavation residues on site and off site on road approaches.
Welding gear	Demolitions, erection of structural steel and in mechanical installations
Elevation platforms	For use by employees erecting steel, cladding and general construction at height.
Small tools – grinders, saws, drills, kango hammers, powerfloats, temporary lights, water pumps, concrete vibrators.	For use during all stages of construction.

Other Elements

Further areas dealt with within the CEMP include Noise (Section 3.4 of the CEMP); dust management plan (Section 3.5 of the CEMP, which will all help to mitigate environmental impacts on the wider environment.

Chapter 4.0 of the CEMP presents a detailed discussion of how wastes arising from the project will be addressed (MHL, 2021b).

2. Scope of Natura Impact Statement

This document contains information required for the competent authority (in this instance An Bord Pleanála) to undertake both a Stage One Screening for Appropriate Assessment (AA) and Stage Two AA. The developer has provided information on, and assesses the potential for, the proposed development to impact on the Natura 2000 network (hereafter referred to as European sites)³.

Screening for Appropriate Assessment is required pursuant to Article 6(3) of Directive 92/43/EEC (the Habitats Directive) and Part XAB of the Planning and Development Act 2000, as amended (“the 2000 Act”). Where it cannot be excluded that a project or plan, either alone or in combination with other projects or plans, would have a significant effect on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site’s conservation objectives. The Cloghroe SHD is not directly connected with, or necessary for, the management of any European Site and, consequently, the project is subject to the Appropriate Assessment Screening process.

A Stage Two Appropriate Assessment is required if likely significant effects on European sites arising from a proposed development cannot be ruled out at the screening stage, either alone or in combination with other plans or projects. It is the responsibility of the competent authority to decide as to whether or not the proposed development is likely to have significant effects on European sites, either individually or in combination with other plans or projects.

An NIS, where required, should present the data, information and analysis necessary to reach a definitive determination as to (1) the implications of the plan or project, alone or in combination with other plans and projects, for a European site in view of its conservation objectives, and (2) whether there will be adverse effects on the integrity of a European site. The NIS should be underpinned by best scientific knowledge, objective information and by the precautionary principle.

Accordingly, this NIS provides: -

1. Description of all elements of the proposed Cloghroe SHD;
2. Baseline environment, with respect to the relevant QI/SCI of the European Sites;
3. Information in relation to the Article 6(3) Appropriate Assessment screening exercise (which clearly identifies the European sites that have the potential to be significantly affected by the proposed development and the pathways by which they might be affected);
4. Having conducted the screening exercise, assessment of the potential for adverse effects to occur on the identified European Sites and prescribes mitigation to robustly prevent or have prevented impacts;
5. Assessment of residual effects taking into consideration the proposed mitigation;
6. Appraisal of potential cumulative effects of the proposed SHD on European Sites to occur, when considered in combination with other plans and projects are considered; and
7. Concluding statement.

³ The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe’s most valuable and threatened species and habitats.

In Ireland these sites are designated as European sites - defined under the Planning and Development Acts –as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

2.1. Legislative Context

This Natura Impact Statement is submitted pursuant to subsection 8(2) of the Planning and Development (Housing) and Residential Tenancies Act 2016, to enable the Board to conduct an Appropriate Assessment in accordance with the provisions of Article 6(3) of the Habitats Directive and sections 177U (Stage One Screening) and 177V (Stage Two AA) of the Planning and Development Act 2000.

Article 6(3) of the Habitats Directive provide as follows:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate, after having obtained the opinion of the general public.

This Natura Impact Statement has been prepared in accordance with Section 177T of the Planning and Development Act 2000 and in accordance with the European Commission's Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2001), European Communities (2018) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018) and the Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland (- Guidance for Planning Authorities (DoEHLG, 2010).

In addition to the documents referenced above, the following relevant documents were also considered in the preparation of this report: -

1. Council of the European Commission (1992) Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Official Journal of the European Communities. Series L 20, pp. 7-49.
2. EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission.

2.2. Appropriate Assessment (AA) Process

Guidance on the AA process was produced by the European Commission (EC, 2001; 2018), which was subsequently used to develop guidance for Ireland by the Department of Environment, Heritage and Local Government in 2009 (DEHLG, 2009) and also by the National Parks and Wildlife Service in 2018⁴ (NPWS 2018). These guidance documents set out a staged approach to complete the AA process and outline the issues and tests at each stage.

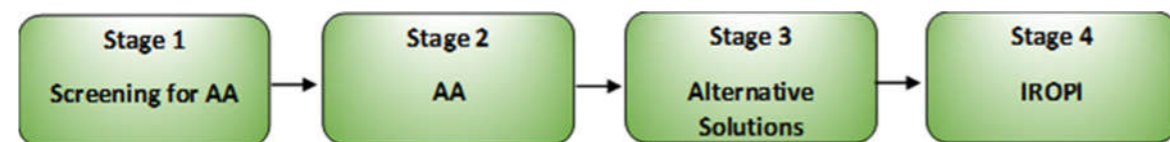


Figure 2.1 Appropriate Assessment Process (Source: DEHLG, 2009).

Only Stage 1 Screening for AA, and Stage 2 AA, are engaged in relation to the proposed Cloghroe SHD. As such Stage 3 (Alternative Solutions) and Stage 4 (IROPI) are not discussed further.

⁴ <https://www.npws.ie/development-consultations>

3. Methodology

This Natura Impact Statement report was prepared with reference and due consideration to the following documentation: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna (Habitats Directive);
- European Commission (2018). Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC;
- European Commission (2021). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC;
- European Commission (2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission;
- Department of the Environment, Heritage and Local Government (2009). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities; and,
- Office of Planning Regulation (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01;
- Planning and Development Act 2000 (as amended) and Planning and Development Regulations 2001 (as amended); and,
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine CIEEM (2018);
- Scott Wilson and Levett-Therivel, (2006). Appropriate Assessment of Plans. Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants;
- Inland Fisheries Ireland (2020). Planning for Watercourses in the Urban Environment. A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning. A Guideline Developed by Inland Fisheries Ireland.

3.1. Desk Study

A desk study was carried out to collate ecological data collect from either the site at Cloghroe or in the immediate environs of the proposed project. These areas were viewed using Google Earth, Google maps⁵ and Bing maps⁶ (last accessed on 29/11/2021).

The National Parks and Wildlife Service (NPWS) online databases were reviewed concerning European sites and their features of interest in the vicinity of the proposed project. The Environmental Protection Agency (EPA) mapping⁷ system was used to identify any hydrological connection between the proposed project and European sites, this information was supported by photographs from walkover surveys. Boundary shapefiles were also downloaded from this site to facilitate consideration of sites and the preparation of project graphics. The analysis was not restricted to sites with 15km (DoEHLG, 2009; OPR, 2021).

⁵ <https://www.google.ie/maps>

⁶ <http://www.bing.com/maps/>

⁷ <https://gis.epa.ie/EPAMaps/>

Desktop information on relevant European sites were reviewed on the NPWS website, including the site synopsis for each SAC/SPA, the conservation objectives, the site boundaries as shown on the NPWS online map viewer, the standard Natura 2000 Data Form for the SAC/SPA which details conditions and threats of the sites, and published information and unpublished reports on the relevant European sites.

The National Biodiversity Data Centre (NBDC) was accessed for information on protected habitats and species known from the 2 km grid square W57S within which the site is located (last accessed on 29th November 2021). Bat records within 4km of the survey area were also reviewed using the NBDC website.

The conservation status of mammals within Ireland and Europe is evaluated using one or more of the following documents; Wildlife Acts (1976 - 2012), the Red List of Terrestrial Mammals (Marnell *et al.*, 2009) and the EU Habitats Directive 92/43/EEC.

Birds of Conservation Concern in Ireland, No. 4 (BoCCI), published by BirdWatch Ireland and the RSPB NI, is a list of priority bird species for conservation action on the island of Ireland (Gilbert *et al.*, 2021) The BoCCI lists birds which breed and/or winter in Ireland and classifies them into three separate lists; Red, Amber and Green; based on the conservation status of the bird and hence their conservation priority. Birds on the Red List are those of highest conservation concern, Amber List are of medium conservation concern and Green List are not considered threatened (see Table 9.1).

The Ecological Appraisal submitted for planning approval in 2018 for the site to the east of the proposed site was reviewed to determine the state of the adjacent lands (Sexton, 2018).

The 'zone of influence' for a project is the area over which ecological features may be subject to significant effects because of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

It follows that, given the nature of the proposed Cloghroe SHD, the zone of influence will be limited to the development site and immediate environs as well as areas connected via hydrological pathways (ground or surface water) and landscape features such as hedgerows, treelines and watercourses.

Determining the potential for impacts and the zone of influence is based on the source-pathway receptor chain principle and involves assessing likely significant effects on ecological receptors within the zone of influence in relation to three pathways: -

- Surface water
- Groundwater
- Land & Air

3.2. Site Visit

As noted in Section 1.2.1 an ecological walkover survey of the site was conducted by an Atkins ecologist on the 23rd October 2020 and 25th August 2021. The purpose of the survey was to characterise and record the habitats and sensitive ecological receptors within and adjacent to the channels included in the study area. The site was visited on the 12th and 26th November 2020 to undertake terrestrial mammal survey work. Bat survey work was undertaken on site in May 2021 and September 2021. The river adjoining the site was also walked in September 2021 to check for signs of Otter (*Lutra lutra*). The findings of these surveys are summarised in Section 1.2.1 and in the Biodiversity chapter of the EIAR that accompanies this application.

3.3. Statement of Authority

The Natura Impact Statement report was prepared by Emma Nickelsen and Paul O'Donoghue and reviewed by Niamh Sweeney.

Paul O'Donoghue has a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. Paul is a chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 20 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments / Natura Impact Statements (i.e. Appropriate Assessment under Article 6(3) of the EU Habitats Directive). Paul carried out the technical review of this report.

Emma Nickelsen has a BSc (Hons) in Environmental Biology and an MSc in Marine Biology. Emma has worked in ecological and environmental consultancy since 2017, working on a wide range of projects including bridge works, road construction, local amenity development and renewable energy. A focus of Emma's work to date has been on conducting Appropriate Assessment screenings, ecological appraisals and supporting the preparation of Natura Impact Statements and Ecological Impact Statements. Emma assisted in the preparation of this report.

Niamh Sweeney (BSc, MSc (Res)) is a freshwater ecologist with 10 years' experience in ecological consultancy, with specialisms in macroinvertebrate and diatom taxonomy. Niamh has worked on numerous Screenings for Appropriate Assessment, Natura Impact Statements and Ecological Impact Assessments for private architect firms, waste companies, numerous County Councils, the OPW and Inland Fisheries Ireland.

4. Existing Environment

4.1. Desktop Review

The proposed site is located to the west of the R617 outside Tower, northwest of Cork City. The landscape consists of rural land on the outskirts of suburban development. The site is 7.3ha in area and comprises two large agricultural fields, associated land drains and an area of woodland along the R617.

The first order Dromin Stream (EPA code: IE_SW_19S010500) flows from north to south along the western side of the site. The stream rises approximately 250m north of the site, flows along the entire western boundary and enters the Owennagearah / Currabeha River approximately 180m downstream of the site. The Currabeha River enters the River Shournagh a further 1.2km downstream, to the east of the site. The site is located in the Lee [Cork] subcatchment (Lee[Cork]_SC_060; Subcatchment Id 19_8). The closest hydrologically connected record of water quality is Q-value records of the Shournagh upstream and downstream of the confluence with the Currabeha River. These records date from 2017 and 2019, respectively, and assign a Q-value of 4-5 (High) to both sites. Meanwhile, the Dromin Stream, Currabeha River and River Shournagh have been assigned Moderate Status under the Water Framework Directive.

Downstream of the site the River Shournagh joins the main channel of the River Lee at Leemount to the west of Cork City. After flowing through the City, the Lee enters Lough Mahon (Cork Harbour). Lough Mahon has a surface area of approximately 12.23km² stretching from Mahon to Passage West (CRFB, 2008), with its volume changing over the tidal cycle. The harbour is classified as transitional waters (Inner Harbour) and coastal waters (Outer Harbour). The closest elements to the proposed site at Cloghroe would be the lower reaches of the River Lee and Lough Mahon, both of which are within the transitional waters of the Inner Harbour.

ERU (1989) found that “many of the environmental parameters measured in the harbour show a gradient extending from the upper harbour and estuarine areas, through the lower Harbour to the Harbour mouth. Thus, going in this direction, BOD loadings, phosphate, nitrate, and ammonia levels, bacteria levels, and levels of contaminants in the water, sediments and biota all show a general decrease in values as the Harbour mouth is reached. Dissolved oxygen levels, on the other hand, show an increase along the same gradient” (from T.J. O’Connor & Associates (2009). This pattern of water quality change has also been found in more recent studies (see e.g. Hartnett and Nash, 2015; see also McGovern *et al.* (2020) which provides a detailed summary of background water quality within different sections of Cork Harbour; much of it derived from Costello *et al.*, 2001, prior to the commissioning of Carrigrennan WWTP).

Currently, the harbour’s Water Framework Directive ecological status is defined as Moderate, with its chemical status categorised as Good (2013-2018; source: EPA Maps). Between 2008 and 2018, dissolved inorganic nitrogen (as N); orthophosphate (P) and chlorophyll trends were all downwards, indicating gradual improvements to water quality (source: EPA Maps). This may to some extent reflect the developments being undertaken under the Cork Main Drainage Project which was largely completed in 2004 and achieved the cessation of the discharges of untreated sewage into the Lee Estuary and Lough Mahon (as was predicted in modelling by O’Kane and Barry, 2007 as quoted in Mott McDonald (2008). However, recent EPA data (source: EPA Maps) categorise water quality in much of the harbour and lower River Lee as being of Intermediate status (2018-2020); in contrast areas such as Lough Mahon and Douglas Estuary are categorised as Eutrophic. Recent work on the Lower Harbour, however, should fuel further improvements to water quality in the Lower Harbour in coming years. The proposed development seeks to intercept and control surface waters during both construction and operation at site; detailed measures for same are included in Section 6.2 Mitigation Measures.

The proposed site is not located within any European sites. The proposed site is hydrologically connected via the Dromin Stream, Currabeha River, River Shournagh and River Lee Cork Harbour, within which is located Cork Harbour SPA (004030) and Great Island Channel SAC (001058). Cork Harbour SPA, the closer of the two sites, is located 17.65km downstream of the proposed site.

The NBDC database was searched for records within the 2 km grid square W57S within which the Site is located. The records returned are presented in Table 4.1 below. None of these records occurred within the proposed site. It is unlikely that the Dromin Stream which runs along the western boundary would be utilised by otter given its small size. Likewise, red squirrel is unlikely to regularly occur at the site, compared to the well-connected network of woodland located in the vicinity.

Table 4.1 NBDC Rare and Protected Flora and Fauna.

Species	Date of record	Protected Status	Source
Harlequin Ladybird (<i>Harmonia axyridis</i>)	14/07/2021	Invasive Species	Ladybirds of Ireland
Large Red Tailed Bumble Bee (<i>Bombus (Melanobombus) lapidarius</i>)	11/04/2021	Threatened Species: Near threatened	Bees of Ireland
Eurasian Badger (<i>Meles meles</i>)	31/12/2013	Protected Species: Wildlife Acts	Protected Species: Wildlife Acts
Eurasian Red Squirrel (<i>Sciurus vulgaris</i>)	31/12/2007	Protected Species: Wildlife Acts	Protected Species: Wildlife Acts
European Otter (<i>Lutra lutra</i>)	03/01/2016	EU Habitats Directive Annex II & Annex IV	Protected Species: Wildlife Acts
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	19/09/2008	EU Habitats Directive Annex IV	Protected Species: Wildlife Acts
West European Hedgehog (<i>Erinaceus europaeus</i>)	16/06/2007	Protected Species: Wildlife Acts	Protected Species: Wildlife Acts

The Large Red Tailed Bumble Bee record was from ca. 1km northwest of the site (W569750).

A data request was also submitted to NPWS for information on rare and protected plant and animal species within the 10km grid square within which the site is located (W57); a response was received in November 2020. Records included badger (*Meles meles*), otter (*Lutra lutra*), Irish hare (*Lepus timidus hibernicus*), Irish Stoat (*Mustela erminea* subsp. *hibernica*), Eurasian Pygmy Shrew (*Sorex minutus*) and Common frog (*Rana temporaria*), though none of the records are from within the proposed development site.

A number of rare plants were noted: - Small Cudweed (*Filago minima*; 1893), Lesser Snapdragon (*Misopates orontium*; 1990), Sharp-leaved Fluellen (*Kickxia elatine*; 2014) and Mudwort (*Limosella aquatica*; 2013) (with the year of the most recent observation indicated). None of the records are from within the proposed development site or its immediate environs.

There are no records for invasive plant species such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) or Giant Hogweed (*Heracleum mantegazzianum*) within the site, or in the vicinity of the site.

The proposed site is located in an area with high suitability for bats (Lundy *et al.*, 2011)⁸, particularly Brown long-eared bat (*Plecotus auratus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), and Whiskered bat (*Myotis mystacinus*) which utilise the wooded tracts along the Currabeha and Shournagh Rivers. The western margin of the site, with the dense treeline and the Dromin Stream along with the wet nature of the southern field, provides attractive foraging grounds for these species and good connectivity to the wooded tracts of the River Shournagh. The review of existing records of bat species in the area of the site indicates that six of the ten known Irish species of bat have been recorded within a 4km radius of the proposed site. These bats include pipistrelle species (*Pipistrellus pipistrellus sensu lato*) and soprano pipistrelle (*P. pygmaeus*), Leisler’s bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), Daubenton’s bat (*Myotis daubentonii*) and Natterer’s bat (*M. nattereri*) (Atkins, 2021).

In summary, no habitats of European importance (i.e. Annex I habitats) have been recorded on site. In Ireland, all bat species are classified as Annex IV species under the Habitats Directive. Only the Lesser horseshoe bat (*Rhinolophus hipposideros*), which has not been recorded on site is listed on Annex II. Of the above records Otter is included on Annex II and IV of the EU Habitats Directive.

⁸ [http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata\(v.3\).pdf](http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata(v.3).pdf)

4.2. Site Visit

4.2.1. Habitats

4.2.1.1. Improved agricultural grassland (GA1)

This habitat was recorded widely across the proposed development site and consisted of a number of large fields on the northern side of the proposed development site. These paddocks were separated by post and wire fencing. On the southern side of the proposed development site, the habitat was recorded on the higher, more free draining areas near the wet grassland habitat.

Species present included abundant perennial rye grass (*Lolium perenne*) along with frequent meadow grass (*Poa* sp.) and occasional white clover (*Trifolium repens*). Broad-leaved dock (*Rumex obtusifolius*), nettle (*Urtica dioica*), dandelion (*Taraxacum officinale* agg.), common ragwort (*Senecio jacobaea*), soft rush (*Juncus effusus*), creeping bent grass (*Agrostis stolonifera*) and creeping buttercup (*Ranunculus repens*) were recorded rarely. One paddock on site contained grazing cattle and another was undergoing active manure application. Sward height in the habitat varied between 5 and 10 cm.



Plate 4.1 Improved agricultural grassland (GA1) habitat within proposed site.

4.2.1.2. Wet grassland (GS4)

This habitat was recorded in the lower lying areas on the southern side of the proposed development site. Soft rush was abundant along with creeping buttercup (*Ranunculus repens*). Creeping bent grass (*Agrostis stolonifera*) and perennial rye grass (*Lolium perenne*) were recorded frequently. Nettle (*Urtica dioica*), creeping thistle (*Cirsium arvense*), common ragwort (*Senecio jacobaea*), Yorkshire fog (*Holcus lanatus*), greater birds foot trefoil (*Lotus pedunculatus*) and wavy bittercress (*Cardamine flexuosa*) were recorded rarely. The very wet areas adjacent to the drainage ditch and stream along the southern boundary also contained common sorrel (*Rumex acetosa*), marsh thistle (*Cirsium palustre*) and bog stitchwort (*Stellaria alsine*), all of which were recorded rarely.

The habitat showed evidence of poaching and grazing by cattle with standing water in the poached areas. The ground conditions were wet. Rushy tussocks were c. 0.5 - 0.75 m high with the grassy areas between having a sward height of c. 5 - 10 cm.



Plate 4.2 Wet grassland (GS4) habitat within proposed site.

4.2.1.3. Dry meadows and grassy verges (GS2)

This habitat was recorded along the eastern site boundary under the treeline adjacent to the public road (i.e. outside of the Site). The species present included frequent cocksfoot (*Dactylis glomerata*), ox-eye daisy (*Leucanthemum vulgare*), ribwort plantain (*Plantago lanceolata*) and winter heliotrope (*Petasites fragrans*). Dandelion (*Taraxacum officinale* agg.), red fescue (*Festuca rubra* agg.) were recorded occasionally. Creeping buttercup (*Ranunculus repens*) and common hogweed (*Heracleum sphondylium* ssp. *sphondylium*) were recorded rarely. The grass bank had been recently strimmed, and the sward height was c. 5 - 10 cm.



Plate 4.3 Neutral grassland (GS2) along roadside adjoining the site.

4.2.1.4. Eroding/Upland Stream (FW1)

This habitat was recorded running downhill from north to south along the western boundary of the proposed development site. This watercourse is a first order stream called the Dromin on the EPA mapping website⁹. This stream flows to the third order Currabeha River south of the proposed development site and is eventually connected to the River Lee via the Shournagh River.

The stream consists of both a single and often double channel which flows on either side of a boundary bank on the western side of the proposed development site. At the time of survey, the stream was c. 1 m wetted width,

⁹ <https://gis.epa.ie/EPAMaps/> (accessed 15/12/2020).

was fast flowing and the bed consisted primarily of cobble and gravel sized clasts along with a minor fraction of fine sediments. The depth varied from 5 - 15 cm. The stream is shaded by the mature treeline growing overhead.

A range of species were recorded along the banks of the stream including frequent ivy (*Hedera hibernica*) and bramble (*Rubus fruticosus* agg.) along with occasional wild angelica (*Angelica sylvestris*), meadowsweet (*Filipendula ulmaria*) and opposite leaved golden saxifrage (*Chrysosplenium oppositifolium*). Wood avens (*Geum urbanum*) were rarely recorded.



Plate 4.4. Dromin Stream (FW1) which runs along the western boundary of the site.

4.2.1.5. Drainage Ditch (FW4)

This habitat was most frequently recorded on the low-lying southern portion of the proposed development site with drains recorded along the southern boundary, along the internal hedgerows/treelines and within the wet grassland field, running from east to west, eventually apparently draining to the Dromin stream on the western boundary.

The drains were c. 0.75 - 1 m wetted width and c. 5-10 cm deep with a muddy bed. The water was near stagnant or slow flowing. In-stream and marginal vegetation consisted of occasional floating sweet-grass, brooklime, common duckweed (*Lemna minor*), bog stitchwort (*Stellaria alsine*), creeping buttercup (*Ranunculus repens*), soft rush (*Juncus effusus*), creeping bent grass (*Agrostis stolonifera*), wild angelica (*Angelica sylvestris*) and starwort (*Callitriche* sp.).



Plate 4.5. Drainage ditch (FW4) habitat within proposed site.

4.2.1.6. Hedgerow (WL1)

This habitat was recorded within the proposed development site, often in association with treeline habitat, along the northern boundary of the site and the internal field boundary in the centre of the site.

The hedgerow habitat of the internal field boundary consisted of low earth and stone bank vegetated by frequent willow (*Salix* sp.) and bramble (*Rubus fruticosus* agg.). Gorse (*Ulex europaeus*) was recorded occasionally. Hawthorn (*Crataegus monogyna*) and dog rose (*Rosa canina* agg.) were recorded rarely. Bramble was frequently recorded. Pedunculate oak (*Quercus robur*) and birch (*Betula* sp.) trees were recorded occasionally.

The hedgerow along the northern boundary of the proposed development site consisted of stone and earth bank c. 1 m high with frequent hawthorn and bramble along with occasional nettle (*Urtica doica*), gorse and soft shield fern (*Polystichum setiferum*). Blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), crab apple (*Malus sylvestris*), foxglove (*Digitalis purpurea*) and dog rose were rarely recorded. This hedgerow showed no evidence of recent management with most thorny shrubs growing as trees interspersed with gaps, which were less frequently recorded in the western end. The thorny species grew to c. 6-10 m high. Mature ash and oak trees were recorded on the eastern and western sides of this hedgerow feature and grew to c. 20m high.



Plate 4.6. Hedgerow (WL1) habitat within proposed site.

4.2.1.7. Treeline (WL2)

The treeline habitat was recorded at several locations within the proposed development site boundary.

A Sitka spruce dominated treeline formed part of the southern side of the eastern boundary. Willow (*Salix* sp.) grew abundantly on the western side of this treeline along with frequent bramble (*Rubus fruticosus* agg.) and ivy (*Hedera hibernica*). This treeline grew to 8-10 m high. The central and northern portions of this treeline was composed of frequent poplar and occasional oak (*Quercus* sp.) and sycamore (*Acer pseudoplatanus*) which was recorded rarely. The poplar trees grew to c. 10-15 m high with the other semi mature trees reaching 6-10 m.

The western boundary of the proposed development site was also treeline habitat which contained occasional mature pedunculate oak (*Quercus robur*) as well as frequent grey willow (*Salix cinerea*). Holly (*Ilex aquifolium*), gorse (*Ulex europaeus*) and hawthorn (*Crataegus monogyna*) were recorded occasionally below the mature trees. A mature poplar (*Populus* sp.) treeline was located west of this treeline forming a double treeline but was located outside the proposed development site boundary.

A mature/semi mature treeline was recorded south of an existing dwelling on the eastern side of the proposed development site and consisted of frequent birch along with occasional ash (*Fraxinus excelsior*), sycamore and poplar. This treeline grew to c. 10-15 m high.

Part of the southern boundary of the site consisted of several mature pedunculate oak trees forming a short treeline. These trees grew to c. 20 m high. The feature continued to the west in the form of a bushy willow dominated treeline which grew to c. 8-10 m high.

A short section of mature poplar and cypress treeline acting as a shelter belt was recorded on the south side of the farm yard on the proposed development site boundary.

Refer to the accompanying landscape package, including the *Existing Vegetation* figure which highlights desirable trees for protection and retention along the field boundaries.



Plate 4.7. Treeline (WL2) habitat within the proposed site.

4.2.1.8. Mixed broadleaved woodland (WD1)

This habitat was recorded on the eastern side of the proposed development site. The habitat consisted of willow (*Salix* sp.) dominated woodland growing on the top and side slopes of a raised area of land adjacent to the public road. The separate wet willow woodland habitat was located on the lower level adjacent which was c. 2-3 m below the level of the road.

The drier slopes and upper level of the woodland contained willow (*Salix* sp.) which was dominant, with mature and semi-mature single and multi-stemmed willow trees. Sycamore (*Acer pseudoplatanus*) and alder (*Alnus glutinosa*) were recorded rarely (single trees). The field layer was scrubby in nature and consisted of abundant bramble (*Rubus fruticosus* agg.) along with frequent gorse (*Ulex europaeus*), nettle (*Urtica dioica*) and ivy (*Hedera hibernica*). Creeping buttercup (*Ranunculus repens*), wood avens (*Geum urbanum*), herb-robert (*Geranium robertianum*), harts-tongue fern (*Phyllitis scolopendrium*), soft shield fern (*Polystichum setiferum*), winter heliotrope (*Petasites fragrans*) and creeping bent grass (*Agrostis stolonifera*) was recorded occasionally. Broad-leaved dock (*Rumex obtusifolius*) was recorded rarely. There was evidence of recent access by grazing cattle.

Historic aerial photography indicates that this area of woodland has developed from an area of disturbed ground in 1995¹⁰ which appears to have undergone successional change from scrub to willow woodland over the past 25 years according to the aerial photographic evidence.

¹⁰ <http://map.geohive.ie/> (accessed 29/10/2020)



Plate 4.8. Mixed (broadleaved) woodland (WD1) habitat within proposed site.

4.2.1.9. Wet willow-alder-ash woodland (WN6)

The lower level of the willow dominated woodland close to the eastern side of the proposed development site was wetter with saturated, water-logged ground conditions and standing water recorded around the edge of the woodland. Creeping bent grass (*Agrostis stolonifera*), creeping buttercup (*Ranunculus repens*), marsh bedstraw (*Galium palustre*) and fool's water cress (*Apium nodiflorum*) were recorded frequently. Common chickweed (*Stellaria media*), watercress (*Nasturtium officinale*) and marsh thistle (*Cirsium palustre*) were recorded occasionally. Wild angelica (*Angelica sylvestris*) was recorded rarely. Starwort (*Callitriche* sp.) were recorded occasionally on the muddy edges of standing water. The trees were c. 4-6 m high and generally multi-stemmed with access to livestock and some evidence of poached ground as a result. Small areas of standing water were recorded around the base of the raised area and these contained locally dominant common reed (*Phragmites australis*).

Historic aerial photography indicates that this area of woodland has developed from an area of disturbed ground in 1995 which appears to have undergone successional change from scrub. Correspondence with Annex I 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) has been considered. Given the origin of this woodland, and that it is not located on alluvial deposits. The Annex I habitat is generally well drained and infrequently inundated, while the wet woodland present at the proposed site, shows signs of permanent inundation.



Plate 4.9. Wet willow woodland (WN6) habitat within proposed site.

4.2.1.10. Scrub (WS1)

This habitat was recorded in the form of a bramble (*Rubus fruticosus* agg.) dominated scrub growing on the slope leading from ground level within the proposed development site up to the road level. A small linear section of gorse (*Ulex europaeus*) dominated scrub was recorded within the wet grassland habitat on the low-lying southern side of the site.

4.2.2. Invasive Plants

Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) or Giant Hogweed (*Heracleum mantegazzianum*) were not recorded within the site.

Winter heliotrope (*Petasites fragrans*) and cherry laurel (*Prunus laurocerasus*) were recorded within the proposed site as outlined in Figure 4.2. These species are not listed on the 3rd Schedule of the EC(Birds and Natural Habitats) Regulations, 2011 (S.I. 477 / 2011), but their spread should be avoided.

4.2.3. Other Ecology

Trail camera surveys undertaken in November 2020 confirmed that there are no badger setts on site (Atkins, 2021). No signs of otter were recorded on the Dromin Stream; movement along the stream corridor is negatively affected by culverting of the river downstream of the site. Common frog was encountered in the wet grassland at the southern end of the site. A bird community typical of the habitats on site and of local importance (higher value) was noted.

A review of existing bat records from within a 4km radius of the proposed site indicates that six of the ten known Irish bat species had been observed. These include pipistrelle species, soprano pipistrelle, Leisler's, brown long-eared, Daubenton's and Natterer's bat. Of these species, Daubenton's bat has been recorded roosting within 4km of the site. In addition to these species, whiskered bat and lesser horseshoe bat have been recorded foraging at St. Ann's Hydro Hill at Tower (Abbott, 2017), located c.1.4km to the north-east of the proposed site at Cloghroe. Evidence indicating minor bat roosts of brown long-eared bat and whiskered bat was also recorded St. Ann's Hydro Hill, and summer roosts of common pipistrelle, soprano pipistrelle and Leisler's bat also occurred just off-site to the west.

Habitats within the proposed site that are of potential use by foraging and commuting bats include linear features such as the Dromin Stream, hedgerows, treelines and their associated wet ditches, which provide connectivity between the site and other foraging areas in the wider landscape. Overall, the study area is considered to be of high suitability for foraging and commuting bats due to the presence of connectivity to other suitable habitats in the wider landscape. However, roosting opportunities at the site are limited to 4 trees in the field boundaries that support potential roosting features such as cracks in limbs.

Results from the bat surveys undertaken in May and September 2021 indicate that five species of bat, namely soprano pipistrelle, common pipistrelle, Leisler's bat, natterer's and Daubenton's bat regularly commute to the site to forage. Whiskered bat was recorded at the site in the autumn season; and brown long-eared bat was recorded on one occasion on the passive monitors in May, however this species echolocates quietly and, as such, may be under recorded at the site. The level of activity and diversity of species recorded within the proposed site was high. Leisler's bat was recorded early in the evening in May and it is considered likely that a summer Leisler's bat roost is present within one of the houses to the north-east of the site, outside of the site boundary. Soprano and common pipistrelle were recorded relatively close to sunset in May and it is likely that these species also roost nearby in summer.

No trees within the study area were confirmed as roost sites. The location of 4 no. trees identified as having moderate suitability for roosting bats have been identified on site. These will not be removed as part of proposed works.

Common darter dragonflies (*Sympetrum striolatum*) were recorded within the wet grassland and on the drain crossing the centre of the site. A peacock butterfly (*Inachis io*) was recorded basking in hedgerow on northern boundary of site. Large numbers of Large white butterfly (*Pieris brassicae*) were noted on site in August 2021; along with single Tortoiseshell (*Aglais urticae*) and Red Admiral (*Vanessa atalanta*). A Hawthorn shieldbug (*Acanthosoma haemorrhoidale*) was also recorded.

4.2.4. Neighbouring Site

Based on the 2018 Ecological Assessment of the neighbouring site (Sexton, 2018), located on the western bank of the Dromin Stream, the lands in this site are dominated by GA1 improved agricultural grassland lined by treelines (WL2) and earth banks (BL2). There are two small areas of scrub (WS1) comprising holly, as, sycamore, brambles and gorse. Other habitats recorded included a stone wall (BL1), drainage ditch (FW4) and lowland depositing stream (FW2). The treelines and stream were evaluated as being of Local ecological value, with all other habitats were assessed as important at a Site level. No rare plant species or invasive plant species were recorded on site. Mixed broadleaved (WD1) woodland is located south of the R579.

Signs of mammals were noted along the field boundaries which it was noted could be either badger, fox (*Vulpes vulpes*) or rabbit (*Oryctolagus cuniculus*); but no badger setts or burrows were located. The drainage ditches on site were noted as potentially providing suitable habitat for Common frog. Bird species noted on site are discussed below. The study did recommend completion of a bat survey and a mammal survey.

The site was resurveyed in 2021 (Greenleaf Ecology, 2021). This included a phase 1 habitat survey and survey of invasive species (19th July 2021); survey for terrestrial mammals such as badger; and bats surveys (19th to 24th July 2021). A survey of trees potential to be bat roosts was undertaken on the 19th July 2021. Two of the passive monitors erected were along the western boundary of the site which is the subject of this application.

No rare plant species or invasive plant species were recorded on site in 2021. No trees within the site were categorised as potential bat roosts; two trees were identified as having moderate suitability; one tree as having low suitability. These are not on the boundary of the site which is the subject of this application. Activity surveys recorded Soprano pipistrelle, Common pipistrelle and Leisler's bat on site in July 2021; with Common pipistrelle being the most commonly recorded.

The passive monitors recorded five species of bat; namely, Soprano pipistrelle, Common pipistrelle, Leisler's bat, Daubenton's bat and Natterer's bat. Common pipistrelle was again the most recorded on two of the monitors; with Soprano pipistrelle being the most common on the third passive monitor. Daubenton's bat was noted close to the Dromin Stream; while there was only a single record of Natterer's bat.

No signs of badger were recorded. No evidence of otter was recorded on the site or Dromin Stream (Greenleaf Ecology, 2021).

5. Stage 1 Screening for Appropriate Assessment

This section of the NIS has been included to provide the information necessary to allow the competent authority to conduct an Article 6(3) Stage One Screening for Appropriate Assessment in respect of a proposed strategic housing development (SHD). Screening for Appropriate Assessment is required pursuant to Article 6(3) of Directive 92/43/EEC (the Habitats Directive) and Part XAB of the Planning and Development Act 2000, as amended ("the 2000 Act"). Where it cannot be excluded that a project or plan, either alone or in combination with other projects or plans, would have a significant effect on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives. The proposed development is not directly connected with, or necessary for, the management of any European site and, consequently, the project is subject to the Appropriate Assessment Screening process.

The purpose of a (Stage One) screening exercise for Appropriate Assessment is to determine whether it is necessary to carry out a Stage Two Appropriate Assessment of the implications for a European site of a project. The trigger for the requirement for an Appropriate Assessment is that the project, either individually or in combination with other plans or projects, is "likely to have a significant effect" on the European site.

It is clear that the trigger for an Appropriate Assessment is a very light one, and that the mere probability or a risk that a project might have a significant effect is sufficient to require an Appropriate Assessment to be undertaken. Under Part XAB of the 2000 Act, screening for Appropriate Assessment must be carried out by the competent authority. As per section 177U of the Planning and Development Act, 2000, as amended, 'A screening for appropriate assessment shall be carried out by the competent authority to assess, in view of best scientific knowledge, if... a proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site'. The competent authority shall determine that an Appropriate Assessment of a proposed development is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The competent authority's determination as to whether an Appropriate Assessment is required must be made on the basis of objective information and must be recorded.

Whereupon the carrying out of a Stage One screening, it is concluded that a Stage Two Appropriate Assessment is required, an applicant for permission must prepare and submit a Natura Impact Statement to the competent authority.

This Article 6(3) Appropriate Assessment Screening Report has been prepared in compliance with the provisions of section 177U of the 2000 Planning & Development Act 2010 as amended.

5.1. Connectivity of Works Area to European Sites

The 'zone of influence' (Zoi) for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change (CIEEM, 2018).

A distance of 15km is recommended in the case of plans, as a potential zone of influence and this distance is derived from UK guidance (Scott Wilson *et al.*, 2006). However, for projects the distance could be much less. National Parks and Wildlife Service guidance¹¹ as well as guidance recently published by the Office of Planning Regulation (OPR, 2021) advises that this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects. Thus, given the nature, scale and extent of the proposed project, the potential zone of influence (Zoi) will consider European sites with regard to the Cause-Pathway-Effect model – giving consideration to their qualifying interests, the life history characteristics of these habitats and species, potential mobility of species from a given European site as well as potential connections (e.g. hydrological). In this way

¹¹ DoEHLG (2009). *Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities.* Department of Environment, Heritage and Local Government, Dublin, Ireland.



consideration is given the potential interaction of proposed works with European sites across factors other than just distance (i.e. the Cause-Pathway-Effect model).

Thus, given the nature, scale and extent of the proposed project, the potential zone of influence will consider European sites with regard to the location of a European site, the QIs of the site and their potential mobility outside that European site, the Cause-Pathway-Effect model and potential environment effects of the proposed project.

It follows that given the nature of the proposed project the potential zone of influence will be limited to the closest European sites or to those hydrologically connected to the proposed project.

The following methodology was used to establish which European Sites are within the Likely Zone of Impact of the proposed development: -

1. Initially, the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on 18th October 2021. The datasets were utilized to identify European Sites which could potentially be affected by the proposed development.
2. All European Sites within a distance of 15km surrounding the development site were identified and are shown on Figure 3.1. (Note, however, that in reviewed sites those at >15km were also considered and discounted based on the methods outlined above).
3. There is no potential connectivity between the proposed development site and European site located at a distance of greater than 15km. Potential pathways for connection which were considered include included hydrological (surface water and groundwater); air quality (i.e. dust and other air emissions) and disturbance.
4. The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites. The hydrological catchments are also shown in Figure 3.1.
5. In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
6. Table 3.1, provides details of all relevant European Sites as identified in the preceding steps which are within the likely Zone of Impact. The assessment considers any potential for any direct or indirect impacts of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this screening assessment
7. The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of finalising this report in October 2021.
8. Figure 3.1 shows the location of the proposed development in relation to all European sites within 15km of the proposed development.
9. Where potential for any pathways for Significant Effects are identified, the site is included within the Likely Zone of Impact and is further considered as part of the Stage One screening assessment.
10. There is absolutely no reliance placed in this AASR on (a) measures intended to avoid/reduce harmful effects on the European sites, (b) construction management/best practice measures, or (c)

any other measures (such as SUDS) which are proposed with no relation to the intention of avoiding or reducing any potentially harmful effect of the development on any European site.

5.2. Special Area of Conservation

There are no Special Areas of Conservation (SACs) or candidate SACs within 15km of the proposed project. However, Great Island Channel candidate SAC (001058), which is over 19km from the Site, is connected via the River Lee and Cork Harbour.

The Great Island Channel SAC is located >19km east of the proposed project by land. Part of the Great Island Channel SAC is within Lough Mahon and the area of the SAC within the Lough is located downstream along the Shournagh / River Lee from the works in Cloghroe. The Lee flows downstream to Lough Mahon and the westwards extent of Great Island Channel SAC. Thus, while extremely remote, the Great Island Channel SAC is within the zone of influence of the project and is discussed in greater detail below.

Table 5.1 below details Special Areas of Conservation within the zone of influence of the proposed SHD and outlines the qualifying interests for which these sites have been designated.

The only other Special Areas of Conservation in the wider landscape are The Gearagh SAC (000108) which is located upstream of Cork City on the River Lee to the southwest of Macroom (>25km from the site). The site at Tower is not within the same catchment as the Blackwater River (Cork/Waterford) SAC (002170) which is located ca. 18.5km to the northeast. The only other SAC in the environs of the site is the Ballymacoda (Clonpriest and Pillmore) SAC (000077) which is located at the mouth of the Womanagh River ca. 45.5km to the east; again, the Tower site is not within this catchment. These SACs are not deemed to be within the zone of influence of the Cloghroe site and are not discussed further.

Table 5.1 SACs within 15km of the proposed project.

SAC Site Name and Code	Distance from Project Site	Qualifying Interests	Within the Zone of Influence
Great Island Channel SAC (001058)	>19km E	<ul style="list-style-type: none"> • Mudflats and sandflats not covered by seawater at low tide [1140] • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330] 	Yes

5.2.1. Description of Great Island Channel SAC

Great Island Channel SAC is described as follows in the NPWS site synopsis (NPWS, 2013a): -

“The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owenacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

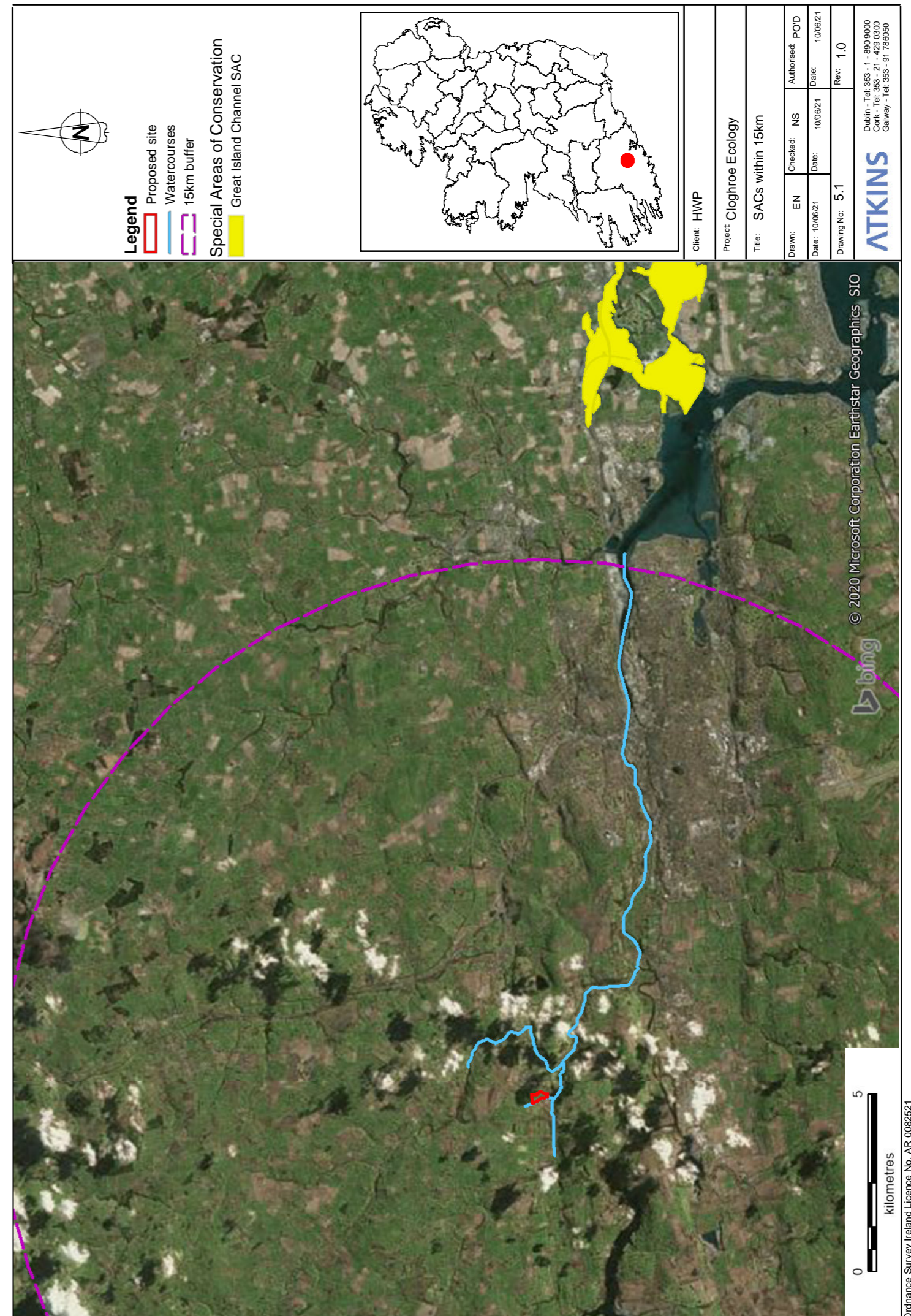
The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably Macoma balthica, Scrobicularia plana, Hydrobia ulvae, Nephtys hombergi, Nereis diversicolor and Corophium volutator. Green algal species occur on the flats, especially Ulva lactuca and Enteromorpha spp. Cordgrass (Spartina spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly. The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (Halimione portulacoides), Sea Aster (Aster tripolium), Thrift (Armeria maritima), Common Saltmarsh-grass (Puccinellia maritima), Sea Plantain (Plantago maritima), Greater Sea-spurrey (Spergularia media), Lax-flowered Sea-lavender (Limonium humile), Sea Arrowgrass (Triglochin maritimum), Sea Mayweed (Matricaria maritima) and Red Fescue (Festuca rubra).”

5.2.2. Conservation Objectives

The conservation objectives for the Great Island Channel SAC and the list of specific attributes and targets defining the conservation objectives for each feature of interest can be found on the NPWS website¹² (last accessed 18/10/21; NPWS, 2014a).

- To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC.
- To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Great Island Channel SAC.

¹² https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001058.pdf



5.2.3. Special Protection Areas

There is 1 no. SPA located within 15km of the proposed site; Cork Harbour SPA (004030).

Cork Harbour SPA is located 13.25km east straight-line distance and 17.65km downstream of the proposed site via the Dromin Stream, Currabeha River, River Shournagh and River Lee. The site is designated for waterbirds that are dependent on the wetlands within the harbour for feeding and roosting. As the proposed site is distantly hydrologically connected to the SPA, Cork Harbour SPA is within the zone of influence of the proposed works.

The details of the SPA, including qualifying interests, are detailed in Table 5.1, while Figure 5.1 displays the distribution of the SPA in relation to the proposed site.

Other sites in the wider environment include The Gearagh SPA (004109), Blackwater Callows SPA (004094); Ballycotton Bay SPA (004022); Ballymacoda Bay SPA (004023); and Blackwater Estuary SPA (004028). These are between 25km and 50km from the Cloghroe site and are designated for a range of wetland birds. There is no evidence that any of the species which might field feed use the site at Cloghroe. These SPAs are not deemed to be within the zone of influence of the Cloghroe site and are not discussed further.

Table 5.1 SPAs within 15km of the proposed project.

Site Name	Approximate distance	Features of Interest	Within Zol
Cork Harbour SPA (004030)	13.25km east straight-line distance; 17.65km downstream	<ul style="list-style-type: none"> • Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] • Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] • Cormorant (<i>Phalacrocorax carbo</i>) [A017] • Grey Heron (<i>Ardea cinerea</i>) [A028] • Shelduck (<i>Tadorna tadorna</i>) [A048] • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Pintail (<i>Anas acuta</i>) [A054] • Shoveler (<i>Anas clypeata</i>) [A056] • Red-breasted Merganser (<i>Mergus serrator</i>) [A069] • Oystercatcher (<i>Haematopus ostralegus</i>) [A130] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] • Common Gull (<i>Larus canus</i>) [A182] • Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] 	Yes

Site Name	Approximate distance	Features of Interest	Within Zol
		<ul style="list-style-type: none"> • Common Tern (<i>Sterna hirundo</i>) [A193] • Wetland and Waterbirds [A999] 	
The Gearagh SPA (004109)	>25km to west	<ul style="list-style-type: none"> • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Mallard (<i>Anas platyrhynchos</i>) [A053] • Coot (<i>Fulica atra</i>) [A125] • Wetland and Waterbirds [A999] 	No
Blackwater Callows SPA (004094)	>35k to the northeast	<ul style="list-style-type: none"> • Whooper Swan (<i>Cygnus cygnus</i>) [A038] • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Wetland and Waterbirds [A999] 	No
Ballycotton Bay SPA (004022)	>40km to the east	<ul style="list-style-type: none"> • Teal (<i>Anas crecca</i>) [A052] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Turnstone (<i>Arenaria interpres</i>) [A169] • Common Gull (<i>Larus canus</i>) [A182] • Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] • Wetland and Waterbirds [A999] 	No
Ballymacoda Bay SPA (004023)	>46km to the east	<ul style="list-style-type: none"> • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Sanderling (<i>Calidris alba</i>) [A144] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Turnstone (<i>Arenaria interpres</i>) [A169] • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] 	No

Site Name	Approximate distance	Features of Interest	Within Zol
		<ul style="list-style-type: none"> • Common Gull (<i>Larus canus</i>) [A182] • Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] • Wetland and Waterbirds [A999] 	
Blackwater Estuary SPA (004028)	ca. 50km east	<ul style="list-style-type: none"> • Wigeon (<i>Anas penelope</i>) [A050] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Wetland and Waterbirds [A999] 	No

5.2.4. Description of Cork Harbour SPA [004030]

Cork Harbour SPA is described as follows in the NPWS site synopsis (NPWS, 2015): -

“Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poul nabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nephtys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall (6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which

occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.”

5.2.5. Conservation Objectives

The Conservation Objectives for Cork Harbour SPA (NPWS, 2014b; 2014c) are to maintain the favourable conservation condition of the bird species as Special Conservation Interests for this SPA.

The favourable conservation status of a species is achieved when: -

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

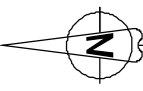
The conservation objective for of Cork Harbour SPA are summarised below.

Objective 1: To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Cork Harbour SPA, which is defined by the following list of attributes and targets: -

Parameter	Attribute	Measure	Target
Population	Population Trend	Percentage change as per population trend assessment using waterbird count data collected through the Irish Wetland Bird Survey and other surveys	The long term population trend should be stable or increasing.
Range	Distribution	Range, timing or intensity of use of areas used by waterbirds, as determined by regular low tide and other waterbird surveys	There should be no significant decrease in the range, timing or intensity of use of areas by the waterbird species of Special Conservation Interest other than that occurring from natural patterns of variation.

Objective 2: To maintain the favourable conservation condition of the wetland habitat at Wexford Harbour and Slobs SPA as a resource for the regularly-occurring migratory waterbirds that utilise it, which is defined by the following list of attributes and targets: -

Parameter	Attribute	Measure	Target
Area	Wetland habitat	Area (Ha)	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587ha, other than that occurring from natural patterns of variation.

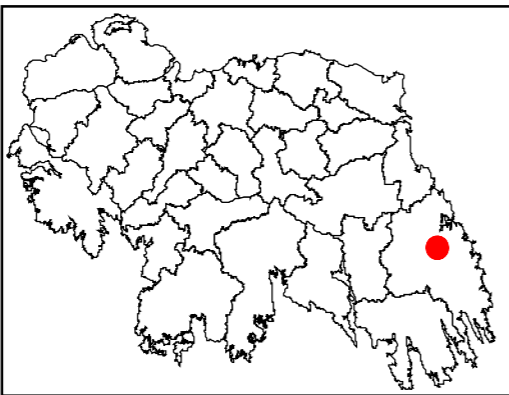


Legend

- Proposed site
- Watercourses
- 15km buffer

Special Protection Areas

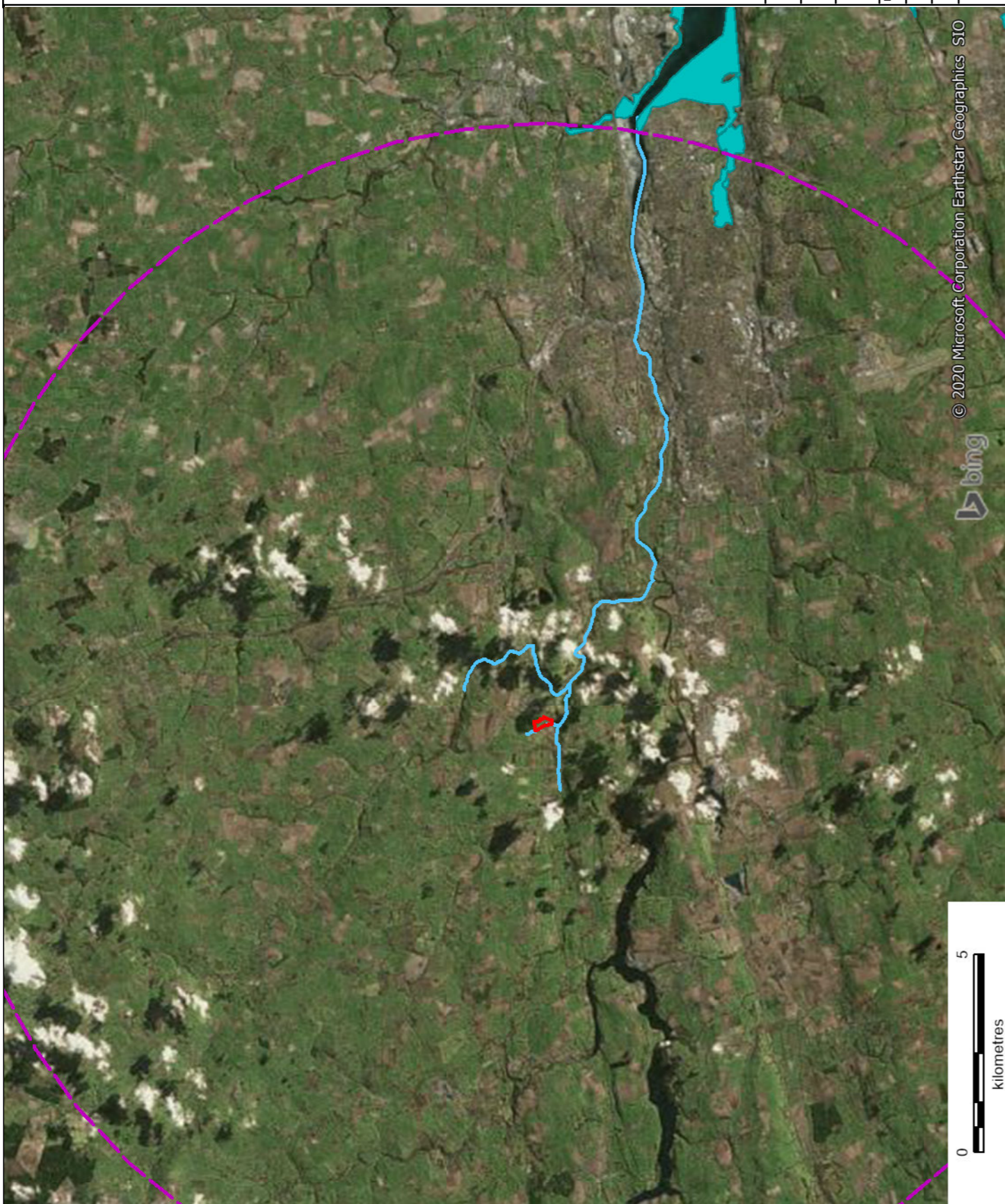
- Cork Harbour SPA



Client: HWP	
Project: Cloghroe Ecology	
Title: SPAs within 15km	
Drawn: EN	Checked: NS
Date: 10/06/21	Date: 10/06/21
Authorised: POD	Date: 10/06/21
Rev: 1.0	

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 Cork - Tel: 353 - 21 - 429 0300
 Galway - Tel: 353 - 91 786050

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5.3. Likelihood of Significant Effects on European Sites

The available information on European sites was reviewed to establish whether or not the proposed development is likely to have a significant effect on the conservation objectives of the designated sites. The likelihood of impacts on the qualifying interests of the European sites identified in this report is based on information collated from the desk study, site plans and other available existing information.

The likelihood of impacts occurring are established in light of the type and scale of the proposed works, the location of the proposed works with respect to European sites and the features of interest and conservation objectives of the European sites.

This report is prepared following the Cause – Pathway – Effect model. The potential impacts are summarised into the following categories for screening purposes.

- Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development or agricultural purposes. Direct impacts can be as a result of a change in land use or management, such as the removal of agricultural practices that prevent scrub encroachment. There are no direct impacts associated with the proposed investigative works.
- Indirect and secondary impacts do not have a straight-line route between cause and effect. It is potentially more challenging to ensure that all the possible indirect impacts of the project – in combination with other plans and projects - have been established. These can arise, for example, when a development alters the hydrology of a catchment area, which in turn affects the movement of groundwater to a site and the qualifying interests that rely on the maintenance of water levels. Deterioration in water quality can occur as an indirect consequence of development, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. The introduction of invasive species can also be defined as an indirect impact. Disturbance to fauna can arise directly through the loss of habitat (e.g. displacement of qualifying interest species) or indirectly through noise, vibration and increased activity associated with construction and operation.

The proposed development does not lie within any European sites. However, the proposed project is hydrologically connected to the Cork Harbour SPA and to Great Island Channel SAC. Adopting a precautionary approach, in the absence of any mitigation measures, best practice/construction measures or any other measures which have no relation to avoiding impacts on European sites, a potential hydrological pathway for indirect effect was identified in relation to QIs associated with Cork Harbour SPA and Great Island Channel SAC.

Following an extremely precautionary approach, these sites are considered to be within the Likely Zone of Impact of the proposed development and further assessment regarding potential for significant impacts thereon is required.

Where potential pathways for effects have been identified, then the potential for cumulative effects resulting from the proposed development when considered in combination with other plans and projects, cannot be discounted at the screening stage and the potential cumulative impacts arising as between the proposed development and other plans and projects are required to be considered as part of a Stage Two Appropriate Assessment.

5.4. Concluding Statement

It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge, on the basis of objective information and in light of the conservation objectives of the relevant European sites, that the proposed development, individually or in combination with other plans and projects, would be likely to have a significant effect on the Great Island Channel SAC and the Cork Harbour SPA.

As a result, a Stage Two Appropriate Assessment is required, and this Natura Impact Statement has been prepared in respect of the Great Island Channel SAC and the Cork Harbour SPA and submitted with the application for permission in respect of the proposed Cloghroe SHD.

6. Appropriate Assessment

This section of the report assesses the two relevant European sites in more detail and examines whether likely significant effects may arise. Where effects are identified that may affect the integrity of the European sites, avoidance and mitigation measures are proposed to offset these effects.

6.1. Identification of potential impacts on the Great Island Channel SAC

6.1.1. Potential Direct Impacts

The proposed development does not occur within or directly adjacent to the Great Island Channel SAC and there will be no direct impacts, such as habitat loss or habitat modification, as a result of the proposed development at Cloghroe.

6.1.2. Potential Indirect Impacts

6.1.2.1. Indirect impacts via surface water run-off during construction and operational phase

The Dromin Steam flows along the western boundary of the site in a southerly direction and discharges to the Owennagearagh / Shournagh River (Lee), which in turn discharges to Cork Harbour. There is, accordingly, a potential hydrological link between the development site and European sites in Cork Harbour.

When considering the potential for impacts on annexed habitats consideration was given to each of the Attributes for Habitat 1140 (Table 6.1) and 1330 (Table 1330) as set out in the Conservation Objective Supporting documentation (NPWS, 2014a).

Table 6.1 Attributes of 1140 Mudflats and sandflats not covered by seawater at low tide (from NPWS, 2014a).

1140		Mudflats and sandflats not covered by seawater at low tide	
To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See Map 3 of NPWS, 2014a.	Habitat area was estimated using as 723ha using OSi data
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex. See Map 4 of NPWS, 2014a.	Based on intertidal and subtidal surveys undertaken in 2006 (Aquafact, 2007) and 2011 (EcoServe, 2012; MERC, 2012). See marine supporting document for further information.

Table 6.2 Attributes of 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritima) (from NPWS, 2014a).

1330		Atlantic salt meadows (Glauco-Puccinellietalia maritima)	
To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritima) in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohil - 1.01ha. See Map 5 of NPWS, 2014a.	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Two sub-sites that supported Atlantic salt meadow were mapped (1.30ha) and additional areas of potential saltmarsh (17.60ha) were identified from an examination of aerial photographs, giving a total estimated area of 18.90ha. Saltmarsh habitat has also been recorded at two other sub-sites within the SAC (Curtis and Sheehy Skeffington, 1998). NB further unsurveyed areas may be present within the SAC. See coastal habitats supporting document for further details.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See Map 5 of NPWS, 2014a.	Based on data from McCorry and Ryle (2009). Within the sites surveyed by the SMP, estuary type saltmarsh over a mud substrate is most common and ASM is the dominant saltmarsh habitat. NB further unsurveyed areas may be present within the SAC. See coastal habitats supporting document for further details.
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Bawnard there is a seawall that was constructed in the 18th-19th centuries. At Carrigatohil the northern and eastern shorelines have been significantly modified by road construction. Part of the saltmarsh has also been infilled. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). The ASM at Carrigatohil is poorly developed, though some of the larger sections contain salt pans. The smaller sections, however, tend to be quite uniform in topography. The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on data from McCorry and Ryle (2009). At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). Zonations to Salicornia flats and intertidal mudflats occurs at Carrigatohil. At Bawnard, there is succession from saltmarsh to brackish saltmarsh and wet grassland as well as zonation to intertidal mudflats at the lower saltmarsh boundary. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Carrigatohil, the sward height is quite tall due to lack of grazing. At Bawnard only part of the site is grazed. See coastal habitats supporting document for further details

Continued.

1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)		
To restore the favourable conservation condition of Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Some poaching was noted in places at Bawnard. See coastal habitats supporting document for further details
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1% where it is known to occur	Based on data from McCorry and Ryle (2009). <i>Spartina</i> occurs at both sub-sites in this SAC. See coastal habitats supporting document for further details

During the construction phase of the project, and as set out above, a construction compound will be established which will not be located in proximity to any drains or surface water features through which sediment or pollutants such as hydrocarbons could be discharged to the Dromin Steam, and subsequently to Cork Harbour.

Furthermore, given the distance between the site and the Dromin Steam, as well as the distance to Cork Harbour, it is not likely that any pollution event at the site could result in significant impacts to Great Island Channel SAC. When considering 1140 - Mudflats and sandflats not covered by seawater at low tide – the proposed development at Cloghroe would not affect either of the listed Attributes for this habitat – i.e. either *Habitat Area* or *Distribution* of this habitat within the SAC.; nor would they affect any of the Attributes listed for 1330 Atlantic salt meadows.

Notwithstanding the fact that such indirect impacts are unlikely to arise, as set out below, a number of measures have been designed and will be implemented in order to ensure that there are no adverse effects arising from the proposed Cloghroe SHD on Great Island Channel SAC.

Once built, surface waters will discharge to the network which ultimately joins the Owennagearagh / Shournagh River (Lee) to the south of the scheme. With regards to the design of the storm water network, it was found that some soil infiltration was possible to the north of the site with no infiltration potential to the south. This result, in combination with a known history of localised flooding, informed the design team that soak pits should not be utilised as a method of catering for surface water within the site. The proposed surface water drainage system is in accordance with Sustainable Urban Drainage Systems (SUDS) principles and divides the site into six (6) drainage catchments: all of which are proposed for attenuation utilising Stormtech Underground Chamber systems (fitted with silt and petrol interceptors). The hydrocarbon interceptor proposed to be used is the Kingspan Environment NSBE010 - NSBE030 Class I Bypass Separators (for full details refer to the accompanying Engineering Report). During construction silt will be removed from the surface water runoff during construction via the use of settlement ponds.

Each attenuation system is designed with a controlled flow rate of less than the greenfield run-off rate for the catchment area. This results in an overall discharge from the site of 20.8 l/s which is less than the greenfield run-off of 25.29 l/s. The attenuated systems will ultimately discharge into the Owennagearagh River via the public storm sewer present on the R617. Attenuation tanks have been designed for a storm return period of 1 in 100 year and with a 20% climate change factor. Refer to the accompanying Engineering Design Report for full details (MHL, 2021a).

In all there will be 6 no. attenuation tanks (A to F) across the site with selected chambers based on available area and depths. Chamber models proposed as follows: -

- A: Stormtech MC3500 chambers
- B: Stormtech SC740 chambers
- C: Stormtech SC740 chambers
- D: Stormtech MC3500 chambers
- E: Stormtech SC740 chambers
- F: Stormtech SC740 chambers

In addition to Attenuation tanks the central land drain is to be expanded to allow for floodable areas, allowing an element of infiltration and recharge to groundwater. All attenuation will be fitted with Hydrobrake to control flow to greenfield rates. Elements of permeable paving may be considered as part of the design in places in order to maximise areas of infiltration that can also to provide a 1st pass cleansing prior to discharging to the central greenspace 'wet' areas. Tree-pits, which would act in the same way, are also proposed as part of the final drainage design.

Thus, based on a review of Attributes listed in Table 6.1 and 6.2, with the introduction of the Attenuation tanks and central land drain expansion, indirect impact through surface waters to either 1140 (Mudflats and sandflats not covered by seawater at low tide) or 1330 (Atlantic salt meadows) will not occur.

6.1.2.2. Potential Indirect Impacts during construction and operational phase via groundwater (hydrogeological pathway)

Excavation works on site can interact with groundwater and have the potential to expose groundwater to contamination by concrete, hydrocarbons and other chemicals used in construction. Vulnerability of groundwater at the southern side of the site is described as High; while that along the eastern and northern portion of the site is defined as Extremely vulnerable.

The Site Investigation for the upper part of the site did not find ground water at the proposed excavation depths. There are no basements proposed for the residential or commercial units. It is proposed to construct underground surface water attenuation tanks. Construction and excavation activities may, therefore, occur below the natural water table. Due to the topography of the site, some of the depths required for the attenuation tanks are likely to breach the water table (namely attenuation tanks AT-B, AT-C, & AT-E). In the case where this is required, an impermeable membrane will be used around the storage chambers to prevent interference between collected water and groundwater.

However, once dewatering ceases, groundwater will recover to its original level. The temporary alteration of ground water levels on-site will be minor and will not have a significant impact on the Lough Mahon Transitional Water Body ground waterbody feeding Cork Harbour to the east. The results of ground investigation can be read in full in the accompanying Engineering Design Report for full details (MHL, 2021a). In landscaped areas of the site surface water will naturally infiltrate to soils and ultimately groundwater; all other waters will be intercepted by the surface water management system as discussed above.

It is therefore considered that the proposed development will not negatively impact on water quality within Great Island Channel SAC; nor will it impact, directly or indirectly, any of the habitats or species listed as features of interest for Great Island Channel SAC. However, as is good practice, a series of environmental protection measures are proposed during both construction and operation, which are detailed in full in the accompanying Construction and Environmental Management Plan (CEMP) (MHL, 2021b) – with the principal measures included in this NIS under the heading “Mitigation” below.

6.1.2.3. Potential Indirect impact / damage through discharge of treated foul effluent.

The construction and operational foul sewer amenities of the proposed development will connect to the existing network and be directed to the Cloghroe Pumping Station from where it pumps to Blarney WWTP. Upgrade works required at the Cloghroe Waste Water Pumping Station are limited to upgrading of the pump. Irish Water has confirmed that, once the pump is replaced, the pumping station has the capacity to adequately process the additional discharge from the operational demand of the proposed Cloghroe development (refer to the accompanying Engineering Report; MHL, 2020). The proposed discharge from the proposed SHD is within the licence parameters of the Blarney WWTP.

Therefore, operational discharge of foul to the existing network will not result in any adverse effects on the Great Island SAC.

6.1.2.4. Proposed Indirect habitat/species loss/damage via spread of invasive species (if present at the study site).

The introduction and spread of invasive species can also result in negative impacts within a designated site. As noted, no species listed on the 3rd Schedule of the EC (Bird and Natural Habitats) Regulations, 2011 (S.I. 477/2011), have been recorded on site. As a result, no adverse effects shall occur on the Great Island Channel SAC as a result of the potential spread of invasive species. However, as is good practice strict biosecurity measures will be implemented on site as outlined under Mitigation, below.

6.1.3. Identification of potential impacts on the Cork Harbour SPA

6.1.3.1. Potential Direct Impacts

The proposed development does not occur within or directly adjacent to the Cork Harbour SPA and as such there will be no direct impact such as habitat loss or habitat modification as a result of the proposed development at Cloghroe.

Furthermore, there is no risk of indirect impacts through disturbance to birds using Cork Harbour SPA as the proposed development site is distant from the SPA and will not affect the species or habitats for which the SPA is designated. Field feeding birds such as Oystercatcher (*Haematopus ostralegus*), Black-tailed Godwit (*Limosa limosa*) or Curlew (*Numenius arquata*), which are qualifying interests of Cork Harbour SPA, have not been recorded within the proposed development site. While, Snipe (*Gallinago gallinago*) have been recorded on site, Snipe is not a qualifying interest of the SPA.

6.1.3.2. Potential Indirect Impacts

Potential Indirect impacts via surface water run-off during construction and operational phase

The Dromin Steam flows along the western boundary of the site in a southerly direction and discharges to the Owennagearagh / Shournagh River (Lee), which in turn discharges to Cork Harbour. There is, accordingly, a potential hydrological link between the development site and European sites in Cork Harbour.

As set out in Section 5.2.5 the objectives are to maintain population trends and distribution of species for which the SPA is designated; as well as to maintain the Wetland Habitats used by the qualifying interests of the SPA. As noted, there will be no loss of habitats within the SPA. The works are sufficiently remote that there will be no disturbance of birds using the SPA and hence no impact on the numbers or distribution of qualifying interests of the SPA.

Given the distance between the site and the Dromin Steam, as well as the distance to Cork Harbour, it is not likely that any pollution event at the site would result in significant impacts to Cork Harbour SPA or the habitat or bird species it supports. Notwithstanding the fact that such indirect impacts are unlikely to arise, as set out below, a number of measures have been designed and will be implemented in order to ensure that there are no adverse effects arising from the proposed Cloghroe SHD on Cork Harbour SPA.

During the construction phase of the project, a construction compound will be established which will not be located in proximity to any drains or surface water features through which sediment or pollutants such as hydrocarbons could be discharged to the Dromin Steam, and subsequently to Cork Harbour.

Once built, surface waters will discharge to the network which ultimately joins the Owennagearagh / Shournagh River (Lee) to the south of the scheme. With regards to the design of the storm water network, it was found that some soil infiltration was possible to the north of the site with no infiltration potential to the south. This result, in combination with a known history of localised flooding, informed the design team that soak pits should not be utilised as a method of catering for surface water within the site. The proposed surface water drainage system is in accordance with Sustainable Urban Drainage Systems (SUDS) principles and divides the site into six (6) drainage catchments: all of which are proposed for attenuation utilising Stormtech Underground Chamber systems (fitted with silt and petrol interceptors). Each attenuation system is designed with a controlled flow rate of less than the greenfield run-off rate for the catchment area. This results in an overall discharge from the site of 20.8 l/s which is less than the greenfield run-off of 25.29 l/s. The attenuated systems will ultimately discharge into the Owennagearagh River via the public storm sewer present on the R617. Attenuation tanks have been designed for a storm return period of 1 in 100 year and with a 20% climate change factor. Refer to the accompanying Engineering Design Report for full details (MHL, 2021a).

In addition to Attenuation tanks the central land drain is to be expanded to allow for floodable areas, allowing an element of infiltration and recharge to Groundwater. All attenuation will be fitted with Hydrobrake to control flow to greenfield rates. Elements of permeable paving may be considered as part of the design in places in order to maximise areas of infiltration that can also to provide a 1st pass cleansing prior to discharging to the central greenspace 'wet' areas. Tree-pits, which would act in the same way, are also proposed as part of the final drainage design.

Thus, based on a review of Attributes for Cork Harbour SPA (see Section 5.2.5) listed in Table 6.1 and 6.2 indirect impact through surface waters to the qualifying interests of Cork Harbour SPA are not likely to occur.

6.1.3.3. Potential Indirect Impacts during construction and operational phase via groundwater (hydrogeological pathway)

Excavation works on site can interact with groundwater and have the potential to expose groundwater to contamination by concrete, hydrocarbons and other chemicals used in construction. Vulnerability of groundwater at the southern side of the site is described as High; while that along the eastern and northern portion of the site is defined as Extremely vulnerable.

The Site Investigation for the upper part of the site did not find ground water at the proposed excavation depths. There are no basements proposed for the residential or commercial units. It is proposed to construct underground surface water attenuation tanks. Construction and excavation activities may, therefore, occur below the natural water table. Due to the topography of the site, some of the depths required for the attenuation tanks are likely to breach the water table (namely attenuation tanks AT-B, AT-C, & AT-E). In the case where this is required, an impermeable membrane will be used around the storage chambers to prevent interference between collected water and groundwater.

However, once dewatering ceases, groundwater will recover to its original level. The temporary alteration of ground water levels on-site will be minor and will not have a significant impact on the Lough Mahon Transitional Water Body ground waterbody feeding Cork Harbour to the east. The results of ground investigation can be read in full in the accompanying Engineering Design Report for full details (MHL, 2021a). In landscaped areas of the site surface water will naturally infiltrate to soils and ultimately groundwater; all other waters will be intercepted by the surface water management system as discussed above.

It is therefore considered that the proposed development will not negatively impact on water quality within Great Island Channel SAC; nor will it impact, directly or indirectly, any of the habitats or species listed as features of interest for Great Island Channel SAC. However, as is good practice, a series of environmental protection measures are proposed during both construction and operation, which are detailed in full in the accompanying Construction and Environmental Management Plan (CEMP) (MHL, 2021b) – with the principal measures included in this NIS under the heading "Mitigation" below.

6.1.3.4. Potential Indirect impact / damage through discharge of treated foul effluent.

The construction and operational foul sewer amenities of the proposed development will connect to the existing network and be directed to the Cloghroe Pumping Station from where it pumps to Blarney WWTP. Upgrade works required at the Cloghroe Waste Water Pumping Station are limited to upgrading of the pump. These works are covered under Class 58 of the Planning and Development (Amendment) Regulations 2018 for exempted development works by Irish Water. Irish Water has confirmed that, once the pump is replaced, the pumping station has the capacity to adequately process the additional discharge from the operational demand of the proposed Cloghroe development (refer to the accompanying Engineering Report; MHL, 2020). The proposed discharge from the proposed SHD is within the licence parameters of the Blarney WWTP.

Therefore, operational discharge of foul to the existing network will not result in negative significant effects on the Great Island SAC.

6.1.3.5. Proposed Indirect habitat/species loss/damage via spread of invasive species (if present at the study site).

The introduction and spread of invasive species can also result in negative impacts within a designated site. As noted, no species listed on the 3rd Schedule of the EC (Bird and Natural Habitats) Regulations, 2011 (S.I. 477/2011), have been recorded on site. As a result, no adverse effects shall occur on the Cork Harbour SPA as a result of the potential spread of invasive species. However, as is good practice strict biosecurity measures will be implemented on site as outlined under Mitigation, below.

6.2. Mitigation Measures

6.2.1. Environmental Management Plan

Chapter 5.0 of the CEMP (MHL, 2021b) summarises the requirements of the Environmental Management Plan. While these can be reviewed in full in the CEMP, for ease of reference, the principal measures relating to the protection of receiving waters are set out below. The CEMP also sets out the Phasing of the proposed development, which will be as follows (refer to Figure 3.1 – Phasing Diagram of the accompanying CEMP): -

- Phase 1: Bulk excavation across the entire site extents.
- Phase 2: 82 Units including the proposed creche, retail food store and café in the South of the site.
- Phase 3: 109 Units in the North of the site.

The location of site compounds are also illustrated in the CEMP.

EMP1 - Fuel & Oil Management Procedure

Refuelling will take place in the proposed site compound (as set out in Figure 3.1 and 3.2 of the accompanying CEMP).

Refuelling

- Refuelling will be carried out using 110% capacity double bunded mobile bowzers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using.
- Plant nappies or absorbent mats shall be placed under refuelling point during all refuelling to absorb drips.
- Mobile bowzers, tanks and drums shall be stored in secure, impermeable storage area, away from drains and open water.
- To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required.
- Potential leaks from delivery vehicles will be reduced by visually inspecting all vehicles for major leaks.
- In the unlikely event of an oil leak or spill, the leak or spill will be contained immediately using oil spill kits; the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility.
- The Environmental Manager will be immediately informed of the oil leak/spill and will assess the cause and the management of the clean-up of the leak or spill. The Environmental Manager will inspect nearby drains for the presence of oil and initiate the clean-up if necessary.
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound, and also in site vehicles and machinery.
- Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction.

- In the extremely unlikely event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

Oil storage

Oil storage will take place in the proposed site compound (as set out in Figure 3.1 and 3.2 of the accompanying CEMP).

- Fuel containers must be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Leakages of oil from oil stores will be prevented by storing these oils in bunded tanks which have a capacity of 110% of the total volume of the stored oil. Ancillary equipment such as hoses and pipes will be contained within the bunded storage container. Taps, nozzles or valves will be fitted with a lock system.
- The volume of leakages will be prevented through monitoring oil storage tanks/drums for leaks and signs of damage. This will be carried out daily by the Environmental Manager.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re- cycling by an approved service provider.

Environmental Controls

Environmental control measures will be stored in the proposed site compound (as set out in Figure 3.1 and 3.2 of the accompanying CEMP).

- Mobile bowsers, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water.
- Fuel containers must be stored within a Secondary Containment System, e.g. bund for static tanks or a drip tray for mobile stores.
- Ancillary equipment such as hoses, pipes must be contained within the bund.
- Taps, nozzles or valves must be fitted with a Lock System.
- Fuel and Oil Stores including tanks and drums must be regularly inspected for leaks and signs of damage.
- Only designated Trained Operators w authorized to refuel plant on site and emergency spill kits will be present at equipment for all refuelling events.
- Procedures and contingency plans will be set up to deal with emergency accidents or spills.
- Suitable spill response materials and emergency instruction shall be available on site and staff shall have been adequately trained.

Other measures such as Waste, Noise and Dust management are also presented in the CEMP.

EMP6 - Site Environmental Training & Awareness

- Environmental awareness and training shall be achieved by: -

- Site induction, including relevant environmental issues.
- Environmental posters and site notices.
- Method statement and risk assessment briefings.
- Toolbox talks, including instruction on incident response procedures.
- Key project specific environmental issues briefings.

- All managers and supervisors will be briefed on the content and effective implementation of the measures identified in the CEMP.
- Method Statements will be prepared for specific activities prior to the works commencing and will include all environmental protection and mitigation measures identified in the planning application documentation and emergency preparedness appropriate to the activity covered. The Construction Environmental Manager will review key Method Statements prior to their issue.
- Method Statement briefings will be given before personnel carry out key activities for the first time.
- Environmental Training Records are to be retained in the Site Office.

Environmental Controls: Site staff shall be competent to perform tasks that have the potential to cause a significant environmental impact. Competence is defined in terms of appropriate education, training and experience.

EMP7 sets out the Environmental Emergency Response Plan; EMP8 sets out the Monitoring and Auditing Procedure while EMP9 sets out the Environmental Accidents, Incidents & Corrective Action Procedures and EMP10 sets out the Environmental Complaints Procedure (see CEMP; MHL, 2021b). EMP12 sets out the Lighting Pollution Control measures.

EMP13 - Surface Water Management and runoff control measures

Where applicable the following measures will be implemented: -

- Implement erosion control to prevent runoff flowing across exposed ground and become polluted by sediments.
- Intercept and divert clean water runoff away from construction site runoff to avoid cross-contamination of clean water with soiled water.
- Implement the erosion and sediment controls before starting site clearance/construction works.
- Minimise area of exposed ground by maintaining existing vegetation that would otherwise be subject to erosion in the vicinity of the development and keeping excavated areas to a minimum.
- Install a series of silt fences or other appropriate silt retention measure where there is a risk of erosion runoff to watercourses from construction related activity particularly if working during prolonged wet weather period or if working during intense rainfall event.
- Implement sediment control measures that includes for the prevention of runoff from adjacent intact ground that is for the separation of clean and 'dirty' water.
- Install appropriate silt control measures such as silt-traps, check dams and sedimentation ponds.
- Washout from concrete trucks and plant will not be permitted on site.
- Provide recommendations for public road cleaning where needed particularly in the vicinity of drains.

- Controls need to be regularly inspected and maintained otherwise a failure may result, such as a build-up of silt or tear in a fence, which will lead to water pollution so controls must work well until the vegetation has re-established; inspection and maintenance is critical after prolonged or intense rainfall.
- Develop checklists for weekly Site Audits, which must be finalised by the Appointed Contractor and the relevant Personnel informed of their duties.

6.2.2. Biosecurity protocols

Biosecurity protocols shall be implemented during the proposed project to prevent the introduction of invasive species, in particular those listed on the Third schedule to the 2011 Regulations, to site and the further spread of diseases. The following measures will be adopted:

1. All equipment intended to be used at the site shall be: -
 - i. power steam washed at a suitably high temperature or at least 65 degrees, or
 - ii. disinfected with an approved disinfectant, e.g. Virkon or an iodine-based product. It is important that the manufacturer's instructions are followed and if required, the correct contact times are allowed for during the disinfection process. Items that are difficult to soak should be sprayed or wiped down with disinfectant.
2. During the duration of the proposed project, if equipment is removed off-site to be used elsewhere, the said equipment shall be cleaned and disinfected prior to being brought back to the works area of the proposed project.
3. Appropriate facilities shall be used for the containment, collection and disposal of material and/or water resulting from washing facilities of vehicles, equipment and personnel.
4. Importation of materials shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011.

6.3. Overall Assessment of Residual Effects

In view of best scientific knowledge, and on the basis of objective information, in circumstances where the measures which have been identified will be implemented to avoid potential water pollution events, the proposed Cloghroe SHD will not adversely affect surface or ground water during either the construction or operation phase. There will be no adverse effects on any QIs/SCIs of the Great Island Channel SAC or Cork Harbour SPA and their associated targets and attributes, or on any European Site.

As is apposite in the context of a Stage Two Appropriate Assessment, the consideration of the measures which have been identified and which will be implemented to avoid potential water pollution events, results in no reasonable scientific doubt remaining as to the absence of impacts of the project on any constitutive characteristic of any European site. Accordingly, it can be concluded in view of best scientific knowledge, on the basis of objective information that the project will not adversely affect the Qualifying Interests/Special Conservation Interests associated with any European Sites, including the following: -

- Great Island Channel SAC
- Cork Harbour SPA

Accordingly, the competent authority is enabled to conclude that the project will not have an adverse effect on the integrity of any European site.

6.4. Potential In-Combination Impacts

6.4.1. Plans

The proposed development is located within the Settlement Boundary of Tower as identified in the Blarney/Macroom Municipal District Local Area Plan adopted in 2017. Tower is identified within this LAP as a Key Village. As per the Cork City Council Boundary Extension 2019, the site location is now included within the new Cork City Boundary.

The Cork County Development Plan, 2014 sets out policies and objectives for the development of the County during the period of the Plan. The Plan seeks to secure the sustainable development and improvement of the economic, environmental, cultural and social assets of Cork County. The Plan has outlined objectives for biodiversity within the county. These include:

- Providing protection to all designated sites, national and European, and to maintain or develop linkages between these,
- Providing protection to protected plants and animals in accordance with legal requirements, and
- Retain areas of local biodiversity value, ecological corridors and habitats which contribute to the county ecological network, to protect them from inappropriate development.

A Strategic Environmental Assessment (SEA) and Natura Impact Report (NIR) was prepared for the (then draft) Cork County Development Plan, which assessed the CDP and its potential to adversely affect the environment as a whole and the integrity of Natura 2000 sites. The NIR can be read at: -

<https://www.corkcoco.ie/sites/default/files/2021-05/volume-6-environmental-assessment.pdf>

This sets out in full the approach to the Appropriate Assessment, how aspects of the Plan were considered and how the Plan will be implemented and delivered while protecting European sites; thus, ensuring that potential impacts were avoided, reduced or offset. Thus, the finding of the assessments was that the Plan will not adversely affect the general biodiversity and the integrity of Natura 2000 sites due to the incorporation of mitigation measures into the Plan as a result of the assessment processes. A summary of the Screening Assessment is presented in Table 5.2 of the NIR. Chapter 6.0 of the NIR further outlines the consideration of In-Combination Impacts. Of particular relevance here is Section 6.4 - Coastal and Marine Habitats and Species. Primary concerns of relevance here include e.g. - pressure on water quality in coastal and transitional waters.

Table 6.1 sets out in full the *Policy and Plans With Potential To Contribute to In-Combination Effects on EU Sites*. Measures for strict protection of watercourses, waterbodies and water quality and expanded upon in Chapter 7.0 Appropriate Assessment; “Policies for zoned land adjoining EU sites have been reviewed to ensure that they provide appropriate caveats highlighting the sensitive location of the site and the likely or potential need for set-backs and screening to ensure the protection of habitats and the avoidance of disturbance to protected species”. Great Island Channel SAC and Cork Harbour SPA are discussed specifically in Section 7.3.2 of the NIR.

A Strategic Environmental Assessment (SEA) and Natura Impact Report (NIR) was also prepared for the (then draft) Blarney/Macroom Municipal District Local Area Plan, which assessed the LAP and its potential to adversely affect the environment as a whole and the integrity of Natura 2000 sites. The findings of the SEA and NIR were integrated into the LAP, ensuring that potential impacts were avoided, reduced or offset. Thus, the finding of the assessments was that the Plan will not adversely affect the general biodiversity and the integrity of Natura 2000 sites due to the incorporation of mitigation measures into the Plan as a result of the assessment processes.

The Southern Regional Assembly has prepared a Regional Spatial & Economic Strategy (RSES) for the Southern Region. A Natura Impact Report was prepared by RPS for RSES. This can be viewed at: -

<https://www.southernassembly.ie/uploads/general-files/Natura%20Impact%20Report%20%28NIR%29.pdf>

A stand-alone Appropriate Assessment Determination was also published: -

<https://www.southernassembly.ie/uploads/general-files/Appropriate%20Assessment%20%28AA%29%20Determination.pdf>

This concluded as follows: - “The Assembly hereby DETERMINES pursuant to Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act 2000-2018, that the adoption and publication of the RSES as a replacement for the “Regional Planning Guidelines” for the purposes of Section 24 (4) of the Planning and Development Act 2000 (as amended) will not either individually or in combination with any other plan or project adversely affect the integrity of any European Site (as defined)”.

6.4.2. Projects

Projects that have been proposed and/or granted planning permission in the vicinity of the proposed Cloghroe project within the last 5 years were reviewed through the Cork County Council Cork Planning Enquiry System and the National Planning Application Map Viewer (MyPlan.ie). In the vicinity of the proposed project, developments that have obtained planning permission include additional elements to existing residential buildings, e.g. extensions, garages and boundary walls, construction of new residential buildings and retention of and permission for commercial buildings. These developments have conditions attached to their planning permission relating to sustainable development, such as siting of septic tanks, foul surface water and effluent drainage facilities, and clean surface water run-off drainage facilities.

To the west of the site (Ref. 195413; ABP-307785-20) planning permission was refused for a “Construction of 73 no. residential units comprising 5 no. detached 5-bed dwellings, 15 no. detached 4-bed dwellings, 50 no. semi-detached 3 bed dwellings of varying designs and 3 no. terraced 3-bed dwellings. The proposed development will include flood mitigation and protection works along the R579 road and all associated site works including the culverting of an existing stream, foul and storm drainage with attenuation, public lighting, landscaping and amenity areas. The development incorporates 1 no. new access from the R579”. A 3rd party appeal was submitted and permission was refused.

A summary of planning applications in the immediate environs of the site is presented in Table 6.1. The proposed development will not result in negative impacts on any of the features of interest for which the Great Island Channel SAC and Cork Harbour SPA have been designated. In the absence of any significant impacts arising from the proposed Cloghroe SHD, the proposed SHD will not act in-combination to give rise to cumulative effects on any European sites.

Table 6.3 Other relevant developments.

Application Reference	Applicant(s)	Description	Outcome/Current Status
21/40620	Kevin McDonnell and Paul Coburn	Construction of 73 no. residential units, Upgrade of existing access from the R579, flood mitigation works which include works to the R579, culverting of existing streams,	Application is currently being assessed by Cork City Council.
Cork City Council Ref: 20/39202	Tower Residential Developments Limited	Construction of 37 no. dwelling houses	Final permission granted on 19th May 2021.
Cork City Council Ref: 19/39001	Gleann Fia Homes Ltd.	Construction of 40 no. dwelling houses	Final permission granted on 06/01/2021. Construction has commenced on site.
Cork County Council Ref: 19/4718	Whitebon Developments Ltd.	Construction of 12 no. dwelling houses	Final permission granted by Cork County Council on 08/08/2019. Construction has commenced on site
Cork County Council Ref: 18/7111	Hydro Estates Ltd	Construction of nursing home & 21 no. dwelling houses.	Conditional permission granted by Cork County Council on 13/08/2019. Decision upheld by An Bord Pleanála submission of third-party appeals (Ref: ABP-305373-19).
Cork County Reference 18/6802	The Board of Management of Cloghroe National School	The construction of a new car park with 67 no. general parking spaces, 53 no. staff parking spaces, new entrance and all associated ancillary site works at a green-field site opposite Cloghroe National School.	Final Permission granted on 4th December 2019
Cork County Council Ref: 18/5562	Gleann Fia Homes Ltd.	Construction of 54 no. dwelling houses.	Permission granted by Cork County Council for on 27/11/ 2018. Construction has commenced on site with some units completed and occupied.

6.4.3. Conclusion of Cumulative Assessment

Following the detailed assessment provided in the preceding sections, it is concluded that, the proposed Cloghroe SHD will not result in any adverse effects on the integrity of any European site. There is, therefore, no potential for the proposed development to contribute to any potential cumulative adverse effects on any European site when considered in-combination with other plans and projects.

In the review of the projects and plans that was undertaken, no connection that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, there are no residual cumulative impacts with regard to any European Site.

7. Conclusions

This NIS has provided an assessment of all potential direct or indirect adverse effects which have the potential to cause likely significant impacts on European sites.

Where the potential for any likely significant effects on any European Site has been identified then, as is apposite when conducting a Stage Two Appropriate Assessment, consideration has been given to the mitigation measures which have been identified and which will be implemented in order to avoid potential water pollution events, in particular. The measures ensure that the construction and operation phases of the proposed development will not adversely affect the integrity of any European sites. In conclusion, in circumstances where the mitigation measures identified in this NIS are implemented, there is no reasonable scientific doubt remaining as to the absence of adverse effects on the constitutive characteristics of the Great Island Channel SAC and Cork Harbour SPA.

Therefore, it can be objectively concluded that the proposed Cloghroe SHD, whether individually or in combination with other plans or projects, will not adversely affect the integrity of any European site.

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Additional Information

Water status data available on <http://www.epa.ie> and <http://www.wfdireland.ie>.

Site Name: Great Island Channel SAC

Site Code: 001058

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nephtys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactuca* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density

north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poul nabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nephtys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall

(6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

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