July 2020

Stage 2: Appropriate Assessment - Natura Impact Statement

Abbey Quarter – Urban Park and Street

Kilkenny County Council

County Hall, Kilkenny

MALONE O'REGAN ENVIRONMENTAL

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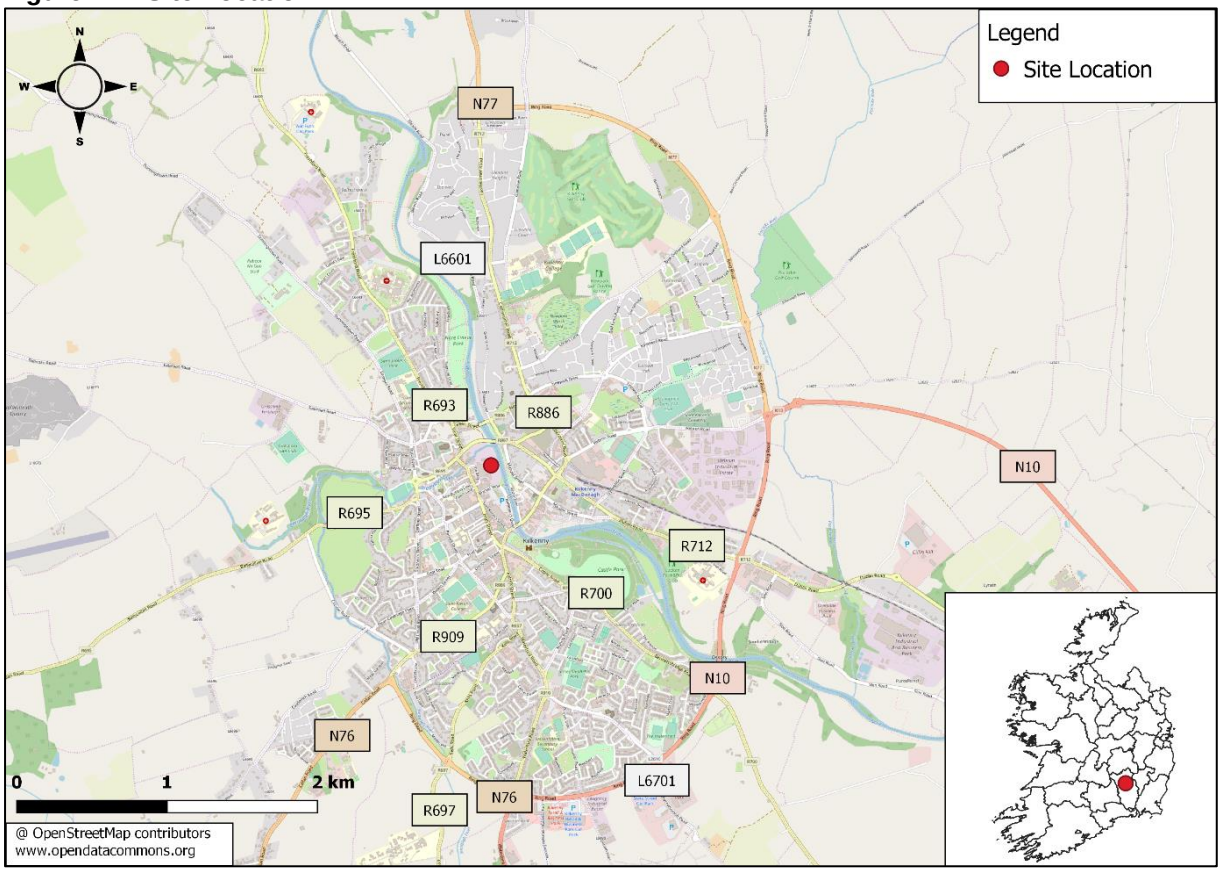
1 INTRODUCTION

Malone O'Regan Environmental (MOR) were commissioned by Kilkenny County Council (KCC) to undertake an Appropriate Assessment to assess the potential adverse effects, if any, of the proposed Abbey Quarter Urban Park and Street located within the former Smithwick Brewery Lands (St. Francis Abbey Brewery) and associated works on nearby sites with European conservation designations (i.e. Natura 2000 sites).

This report has been prepared to inform the planning authority with regard to Stage 1 (Screening) and Stage 2 (Appropriate Assessment) of the proposed development through the research and interpretation of available scientific, geographic and engineering knowledge. This report seeks to determine whether the installation of the proposed development will, on its own or in combination with other plans / projects have a significant effect on Natura 2000 sites within a defined radius of the subject Site.

The location of the proposed development ('the Site') is shown in Figure 1-1 (OS Reference: SF 44888 19470). The proposed Site Layout can be found in Appendix A.

Figure 1-1: Site Location



The purpose of this assessment was to determine the appropriateness, or otherwise, of the proposed works in the context of the conservation objectives of Natura 2000 sites.

1.1 Statement of Authority

The report was approved by Mr. Dyfrig Hubble, Principal Ecologist. Dyfrig is a full member of the Chartered Institute of Ecology and Environmental Management. Dyfrig has over 15 years' experience working in the ecological consultancy sector including habitat appraisals and specialist species specific surveys.

1.2 Regulatory Context

This Natura Impact Statement (NIS) was prepared in accordance with Article 33 of the Planning and Development Regulations 2001 and in compliance with the following legislation:

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "The Habitats Directive" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC as amended 2009/149/EC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (now termed Natura Impact Statement):

> "*Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication 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."*

1.3 Stages of Appropriate Assessment

There are four distinct stages to undertaking an AA as outlined in current European Union (EU) and Department of Environment, Heritage and Local Government (DOEHLG) guidance:

Stage 1: Screening

This process identifies the potential impacts of a plan or project on a Natura site, alone and in combination with other plans and projects and considers whether these impacts are likely to be significant. If potential significant impacts are identified the plan or project cannot be screened out and must proceed to Stage 2.

Stage 2: Appropriate Assessment

Where potential significant impacts are identified, an assessment of the potential mitigation of those impacts is required; this stage considers the appropriateness of those mitigation measures in the context of maintaining the integrity of the Natura 2000 sites. If potential significant impacts cannot be eliminated with appropriate mitigation measures, the assessment must proceed to Stage 3.

Stage 3: Assessment of Alternatives Solutions

This process examines alternative ways to achieve the objectives of the plan or project that avoid adverse impacts on the integrity of the Natura 2000 site if mitigation measures are deemed insufficient.

Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)

Assessment where no alternative solution exists for a plan or project and where adverse impacts remain. This includes an assessment of compensatory measures in the case of projects or plans which are necessary for IROPI.

2 METHODOLOGY

2.1 Desk Based Studies

A desk-based review of information sources was completed, which included the following sources of information:

- The National Parks and Wildlife Service (NPWS) website was consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment (NPWS, 2020);
- The National Biodiversity Data Centre (NBDC) website was consulted with regard to species distributions (NBDC, 2020);
- The EPA Envision website was consulted to obtain details about watercourses in the vicinity of the Site (https://gis.epa.ie/EPAMaps/) (EPA, 2020); and,
- The EPA Catchments website was consulted to obtain details about watercourses in the vicinity of the Site (https://www.catchments.ie/maps/) (EPA Catchments, 2020).

2.2 Field Based Studies

Habitat surveys were undertaken on the 16th of October 2019 and 29th of June 2020 by two (2No.) suitably qualified MOR Ecologists, to assess the extent and quality of habitats present on the Site and to identify any potential ecological receptors associated with the Natura 2000 sites.

The assessment was extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation.

Due to the proximity of the Site to the River Breagagh and River Nore, it was deemed necessary to undertake additional specialist surveys including aquatic, otter and kingfisher surveys as detailed below.

2.2.1 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitat types present indicated could occur on the Site.

2.2.1.1 Aquatic Surveys

Specialist aquatic surveys were undertaken by Sweeney Consultancy on the 7th of August 2019 in sections of the River Breagagh and River Nore that are adjacent to the Site and also within the River Nore downstream of the Site. The surveys aimed to identify the possible presence of the designated qualifying interests of the River Barrow and River Nore SAC including:

- *Callitricho-Batrachion* Floating River Vegetation;
- Nore Freshwater Pearl Mussel (*Margaritifera m. durrovensis*);
- White-Clawed Crayfish (*Austropotamobius pallipes*);
- Atlantic Salmon (*Salmo salar*);
- Brook Lamprey (*Lampetra planeri*);
- Sea Lamprey (*Petromyzon marinus*); and,
- River Lamprey (*Lampetra fluviatilis*).

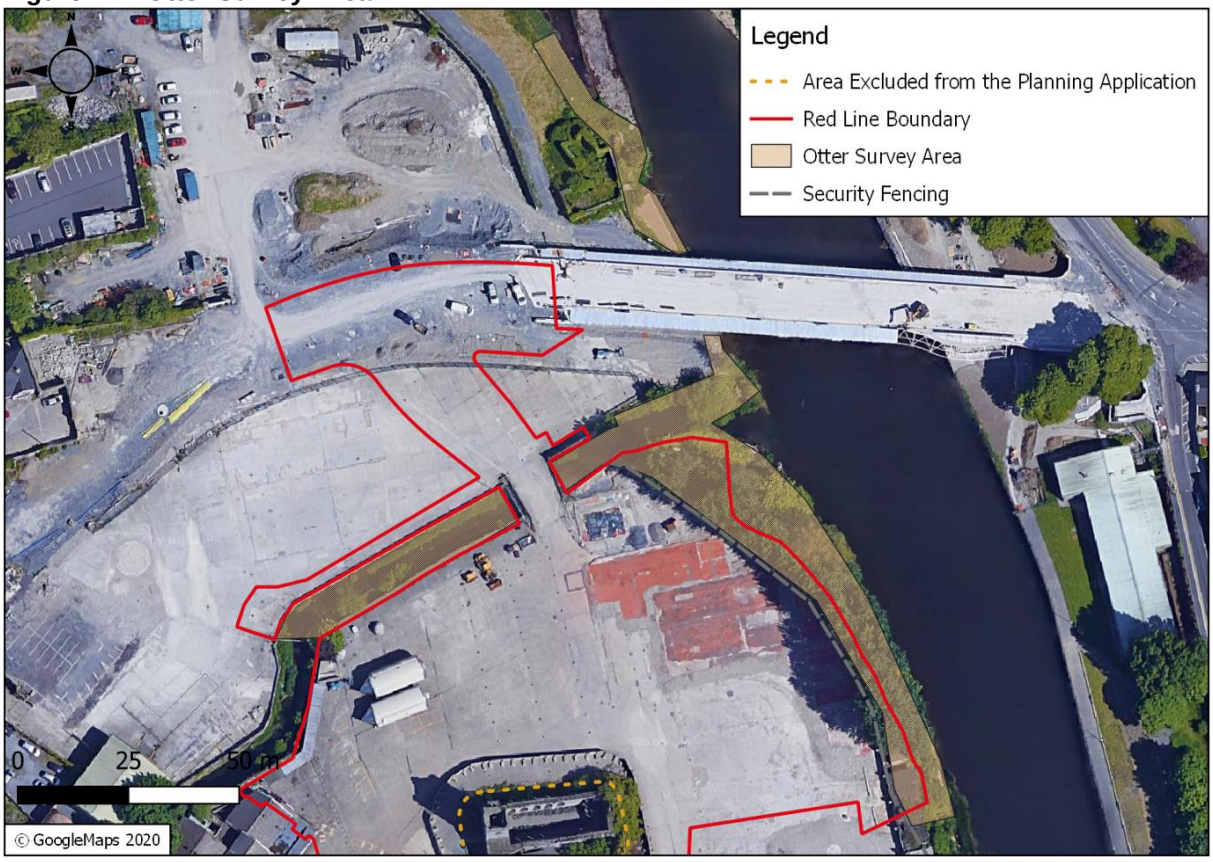
The survey methodology employed during the aquatic surveys can be found in Appendix B.

2.2.1.2 Otter

The otter survey conducted on the 20th of March 2020 investigated areas identified as having potential for otter. These areas included the adjacent sections of the River Breagagh and River Nore (see Figure 2-1). The survey aimed to identify and examine areas where otter might occur by noting any evidence of otter observed. Evidence of otter searched for included:

- Holts (features log piles, caves and cavities);
- Slides (flattered areas of mud or vegetation);
- Paw prints;
- Evidence of foraging (usually in the form of feeding remains such as fish scales and shellfish); and,
- Spraints.

Figure 2-1: Otter Survey Area



Camera Trap Survey

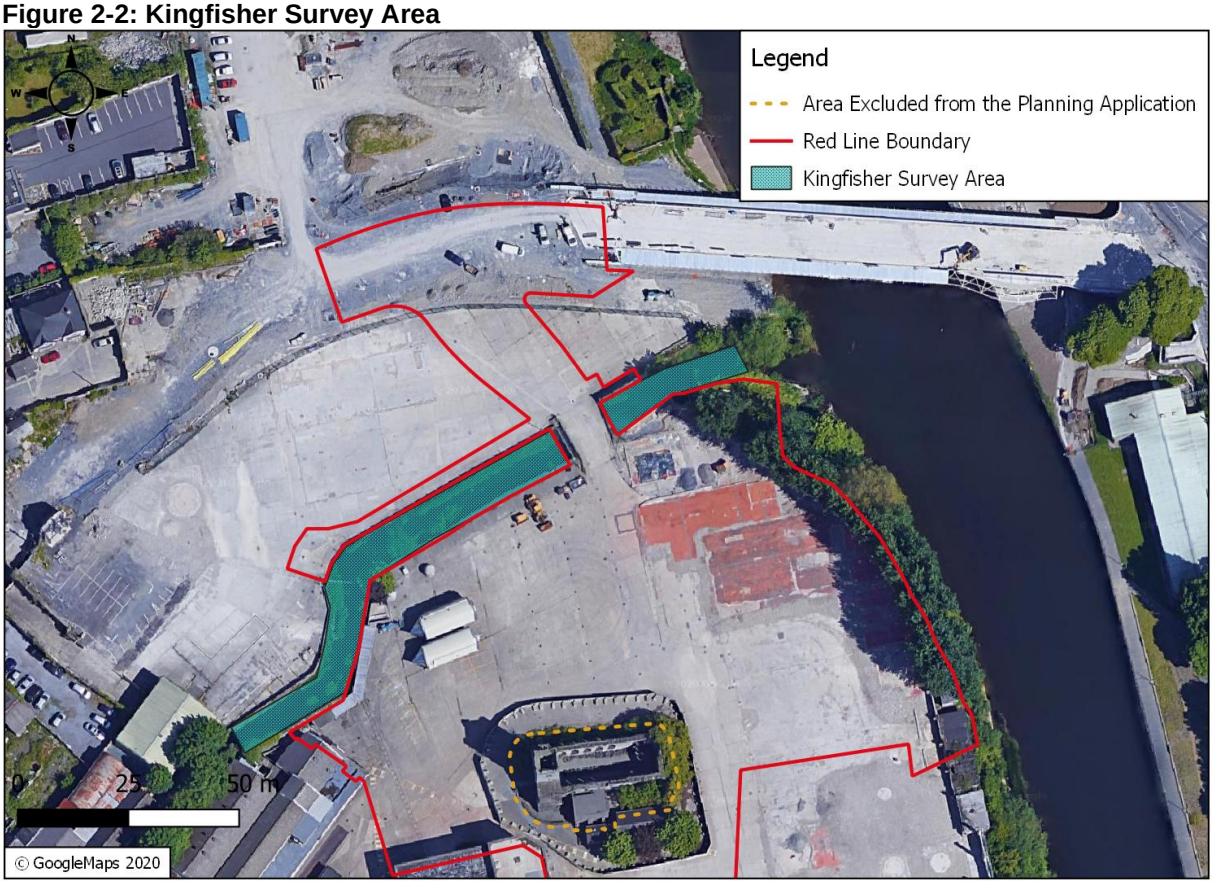
A mammal hole was identified on the riverbank at the confluence of the River Breagagh and the River Nore during the Site surveys. In order to confirm if the hole was active, a camera-trap survey was conducted from the 25th April 2020 to the 16th May 2020.

A Spypoint Force 11D Trail Camera was used. The camera trap was programmed to take 6 consecutive shots at each detection with a 3 second delay between each photo. The camera trap was checked at intervals to replace SD cards and batteries if necessary.

2.2.1.3 Kingfisher

The Site was assessed for its potential to provide nesting habitat for breeding Kingfisher or to support important assemblages of birds of rare or notable species on the 20th of March 2020. The area surveyed can be seen in Figure 2-2.

Figure 2-2: Kingfisher Survey Area



2.2.1.4 Invasive Species

The Site was also assessed for the presence of any noxious / invasive species such as Japanese knotweed (*Fallopia japonica*) and any other invasive species within the Site and adjacent area.

2.2.1.5 Other Species

In addition, an assessment was carried out of the potential for the Site to support any other species considered to be of value for biodiversity, including those that were identified as occurring locally by the desktop study.

2.3 Survey Limitations

No survey constraints were encountered during the different surveys.

3 DESCRIPTION OF THE PROJECT

3.1 Site Context and Description

The Site, ca.1.44 hectares (ha), comprises a portion of the Abbey Quarter Master Plan area, located on the western bank of the River Nore, stretching from Wolfe Tone Street in the north to Bateman Quay in the south and is centred around St. Francis Abbey.

The Site is primarily covered in concrete slabs following the removal of the former brewery buildings in the area. The northern perimeter of the Site is bordered by the Old City Wall, that adjoins the River Breagagh. The eastern boundary of the Site is comprised of the River Nore. The southern and western Site boundaries are bordered by a mix of well-established commercial and residential developments, serving Parliament Street, Horse Barrack Lane, and Green Street.

The proposed development is part of the Kilkenny Abbey Quarter Masterplan; therefore, these works will form part of the overall masterplan. Currently there are several projects associated with the Abbey Creative Quarter Masterplan Development already approved. These projects are objectives as outlined in the Kilkenny City and Environs Development Plan 2014 – 2020 (Kilkenny County Council, 2014) including the following:

- The Riverside Garden Project – approved under Part 8 of the Planning and Development Regulations, 2001, as amended, in February 2016;
- The redevelopment of the Mayfair Ballroom into the City Library – Part 8 Development approved in July 2016; and,
- The redevelopment of the former Smithwick's Brewery Brewhouse building into primarily office space – Part 8 Development approved in December 2017.

At the time of writing, construction works on these projects are all ongoing.

3.2 Watercourses within the Vicinity of the Site

There are two hydrological features within close proximity to the Site: the River Breagagh and the River Nore.

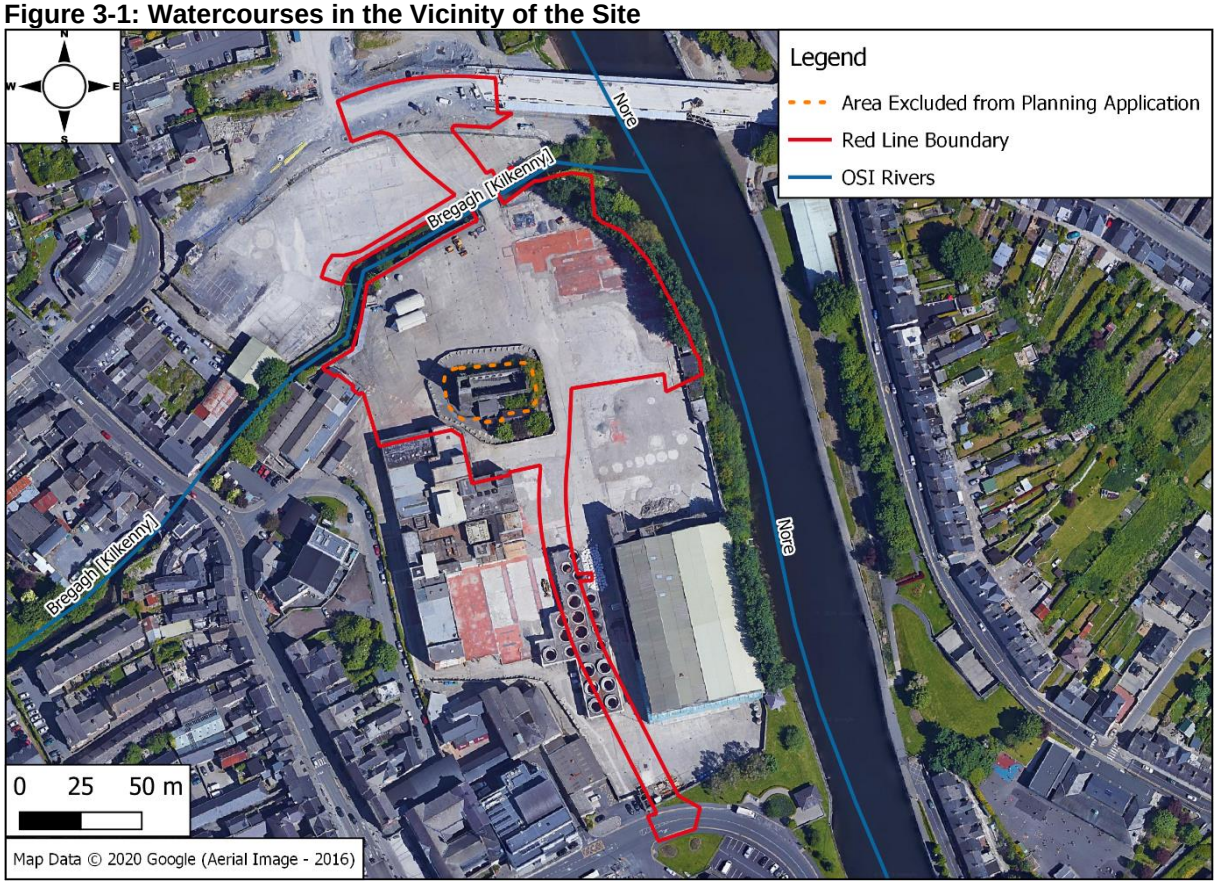
The River Breagagh is located along the northern perimeter of the Site. The river flows in a north-easterly direction and crosses under the existing bridge that forms part of the Site. The River Breagagh is a tributary of the River Nore, which runs in a south easterly direction adjacent to the eastern Site boundary. According to the EPA, the River Breagagh is considered to have '*good*' water quality status, however the risk of the river not achieving '*high*' water quality status is currently under review (EPA, 2020).

Similarly, the section of the River Nore bordering the Site and where the River Breagagh drains into the River Nore is considered to also have '*good*' water quality status and the risk is also under review (EPA, 2020). The River Nore is a designated SAC and SPA.

The Site is situated within the Nore WFD Catchment [Catchment_ID: 15] and the Nore_SC_090 subcatchment [Subcatchment_ID: 15_6] (EPA, 2020).

The two waterbodies within the vicinity of the Site are presented in Figure 3-1.

Figure 3-1: Watercourses in the Vicinity of the Site



3.3 Proposed Development

The proposed development covers an area of approximately 1.44ha and consists of two components;

- Urban Park; and,
- Street.

The Urban Park will consist of a variety of grassed areas, trees, paved surfaces, water features and meeting points. It is proposed that the Park will express known historical features in the area. In addition, the park will provide space to accommodate seasonal markets and other events. There will be no works as part of the proposed development within the Abbey itself.

The Urban Street will link Bateman Quay to the recently opened St. Francis Bridge (formally referred to as the Central Access Scheme). The street will cross over the River Breagagh, using the existing bridge previously utilised by the former Smithwick's brewery site approximately 40m upstream of the River Nore confluence.

The Urban Street will be a pedestrian and cyclist dominated space that will facilitate access to adjoining components of the Abbey Quarter. It should be noted that only limited access to other vehicular through traffic will be available, namely goods and services delivery vehicles serving future buildings. This access will be controlled by use of traffic barriers and a permitting system. Although the proposed development will be a standalone development, for practical reasons the Urban Street will incorporate all utility services required for development of any potential future building plots adjoining the Urban Street. These services include foul water drainage, surface water drainage, electricity, broadband, gas and public lighting.

This project will provide the public space and infrastructure to facilitate the continued implementation of the Abbey Quarter Masterplan. The Site layout is presented in Appendix A.

3.4 Landscape Design Package

A Landscape Design Package including Planting Schedule has been prepared as an integral part of the overall design and submitted with this application. The proposed tree planting is provided in the Landscape Design Package. The inclusion of the landscaping and the ecological enhancement works are in line with the recommendations as detailed within the County Development Plan.

The creation of the landscape park will require the planting of trees as part of the proposed development. In order to recreate the historical orchards of the Abbey, two large tree groves will be planted within the Site. These tree groves will be planted with fruiting trees as described below:

- An ornamental crab apple tree orchard will be planted in elevated flowerbeds with perennial planting within the eastern portion of the Site. A variety of crab apple trees will be planted including *Malus* 'Evereste', *Malus* ' Coralburst' and *Malus* 'Snowcloud';
- Perennial plants will be planted within the Site which are symbolic for the church, edible and medicinal forms of plants will be included such as: *Alchemilla mollis*, *Artemisia officinalis*, *Echinacea purpurea*, *Foeniculum vulgare*, *Fragaria vesca*, *Lavandula officinalis*, *Matricaria reticulata*, *Origanum* 'Rosenkuppel'*, Pulmonaria officinalis, Salvia officinalis, Sanguisorba officinalis* and *Valeriana officinalis;*
- An orchard of fruits will be also be planted using small scale trees including medlar (*Mespilus germanica),* quince (*Cydonia oblonga*) and Sorbocrategus Ivan's Belle; and,
- Planting will also be undertaken to enhance the area adjacent to the river side area, which will create a lush green almost natural vegetated area that will utilise a wide diversity of pollinator friendly plants including: corkscrew hazel (*Corylus avellana Contorta*), Tibetan cherry (*Prunus serrula*), bird cherry (*Prunus padus*), cut-leaved elder (*Sambucus nigra Laciniata*), guelder rose (*Viburnum opulus*) and laurustinus (*Viburnum tinus*).

Planting a range of flowering trees and plants will also provide a source of nectar for a range of species such as butterflies and bumblebees and will attract insects for bats and birds to feed on. Please refer to Landscape Design Package for further details.

3.5 Sensitive Design

Specialist ecological input was a key element of the design process. This was to ensure that the design of the proposed infrastructure works was extremely sensitive to valued ecological features that occur on the adjoining River Breagagh and River Nore.

In addition, improvements to Site drainage formed a key part of the design process. As part of the proposed development new settlement tanks and oil interceptors will be installed in order to improve the water quality discharge from the Site. The incorporation of the landscaped areas will also reduce the volume of water discharging from the Site.

3.6 Construction Procedures

During the construction phase potential environmental effects will be short-term and localised. Nonetheless, all works will comply with the relevant legislation, construction industry guidelines and best practice in order to reduce potential environmental adverse effects.

A preliminary Construction Environmental Management Plan (CEMP) is submitted in support of this application. A final CEMP will then be prepared by the appointed contractor and will be submitted to the planning authority for approval in advance of works commencing at the Site. The following guidance will be referred to and will be required to be followed during the construction phase of the project to prevent water pollution that may occur within the area:

- C532 – Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (Construction Industry Research and Information Association (CIRIA), 2001);
- C648 - Control of Water Pollution from Linear Construction Projects: Technical Guidance (CIRIA, 2006);
- C649 - Control of Water Pollution from Linear Construction Projects: Site Guide (CIRIA, 2006);
- C741 - Environmental Good Practice on Site (4th edition) (CIRIA, 2015);
- Guidance for the Treatment of Otters Prior to the Construction of National Road Schemes (National Roads Authority, 2006);
- All works will be undertaken in accordance with the 'Requirements for the Protection of Fisheries Habitat during Construction and Development' (Inland Fisheries Ireland, 2016); and,
- The recommendations included within the NRA Guidelines for the Crossing of Watercourses (National Roads Authority, 2005).

The proposed works will take approximately 14 months to complete. Working hours will be restricted to between 07:00 and 19:00 Monday to Friday and between 09:00 and 16:00 on Saturdays. Construction works outside these hours will be limited to works necessary for health and safety reasons or to protect the environment

3.7 Monitoring

The construction works will be subject to monitoring by a suitably qualified appointed Ecological Clerk of Works (ECoW), to ensure that the works will be completed in line with the measures and recommendations made within the plans and particulars submitted in support of the planning application and this NIS and any requirements of An Bord Pleanála. In addition, the ECoW will either deliver or provide the resident engineer with sufficient environmental information to deliver a Site induction to all personnel working on-site.

4 IDENTIFICATION OF NATURA 2000 SITES

In accordance with the European Commission Methodological Guidance (European Commission, 2002) a list of European sites that could be potentially impacted by the proposed development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government (DoEHLG, 2009) states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely effects of the project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by a project are: the physical distance from the project to the site; the sensitivities of the ecological receptors; and the potential for in-combination effects. Adopting the precautionary principle, all SACs and SPA sites within a 15km radius of the proposed development Site have been considered.

There are two (No.2) European sites located within 15km of the Site - these are identified in Figure 4-1 and Table 4-1.

Figure 4-1: Site Location and Natura 2000 Designated Sites within 15km

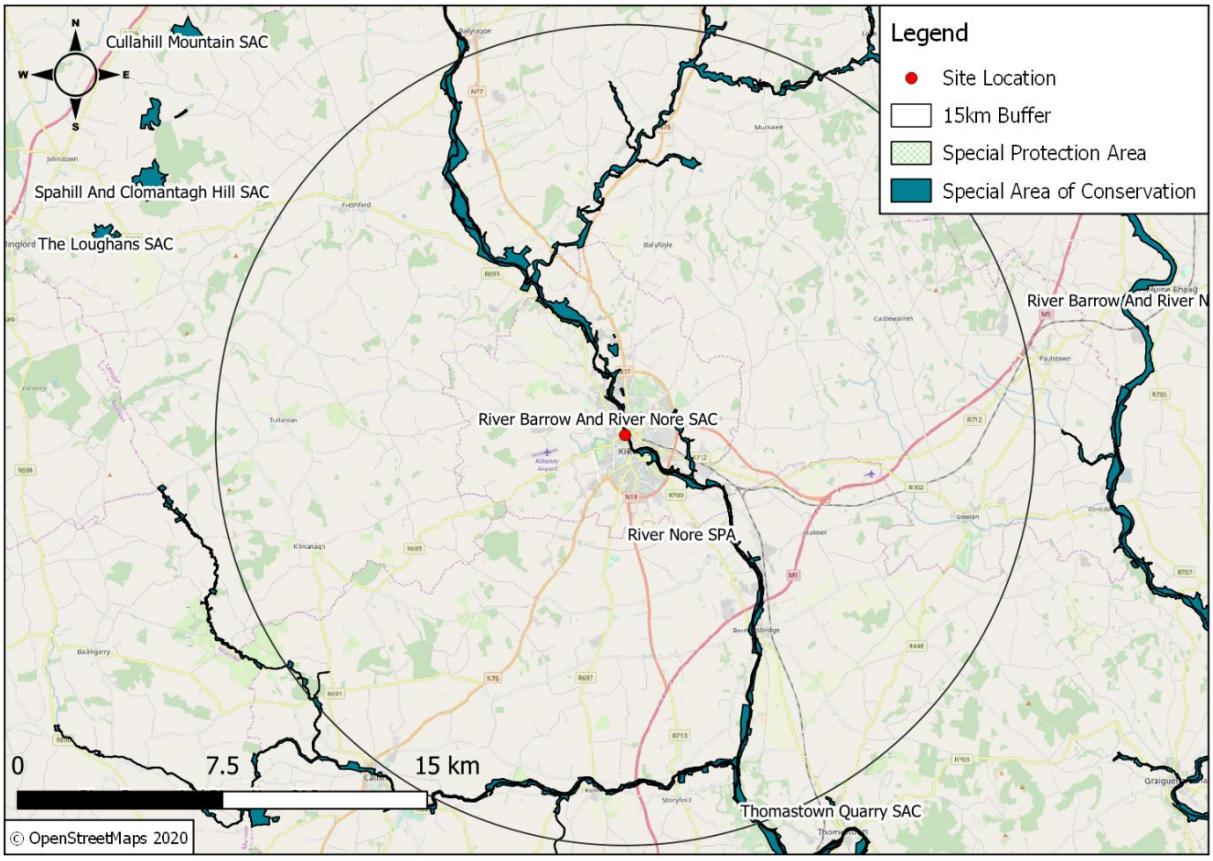


Table 4-1: European Designated Sites within 15km of the Site

Site Name	Code	Distance	Direction from the Site
River Barrow and River Nore SAC	002162	<5	E
River Nore SPA	004233	<10	E

Given the close proximity of the Site to the River Barrow and River Nore SAC and the River Nore SPA, further consideration will be given to these Natura 2000 sites, to assess effects resulting from the proposed development. Further details of the River Barrow and River Nore SAC and the River Nore SPA are provided below.

4.1 River Barrow and River Nore SAC (Site Code: 002162)

The River Barrow and River Nore SAC consists of the freshwater stretches of the Barrow and Nore River catchments extending from the Slieve Bloom Mountains to the estuary and tidal elements in Creadan Head, Waterford.

Species rich habitats (Annex I of the EU Habitats Directive) including estuaries, alluvial forests, petrifying springs, and intertidal mudflats and sandflats can be found within this SAC.

This SAC is of considerable conservation significance for multiple reasons:

- Ornithological importance: This SAC supports Kingfisher, a nationally important bird population listed in Annex I of the EU Birds Directive. One SPA (River Nore), designated under the EU Birds Directive, is also located within the SAC; and,
- This SAC supports multiple species listed on Annex II of the EU Habitats Directive, including Otter, River Lamprey and Salmon.

Land use within the SAC is primarily agricultural, principally grazing and silage production. Fishing is also a main tourist attraction along stretches of the main rivers and their tributaries. Other recreational activities such as boating, golfing and walking also occur within the SAC. The main threats to the SAC and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and sewage plants, along with over-grazing, invasion of non-native species and land reclamation (NPWS, 2011).

Table 4-2: Qualifying Annex I Habitats for the River Barrow and River Nore SAC

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Estuaries	1130	Maintain favourable conservation condition
Mudflats and Sandflats not covered by seawater at low tide	1140	Maintain favourable conservation condition
Salicornia and other annuals colonizing mud and sand	1310	Maintain favourable conservation condition
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)*	1330	Restore favourable conservation condition
Mediterranean salt meadows (*Juncetalia maritimi)*	1410	Restore favourable conservation condition
Water courses of plain to montane levels with *the Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	3260	Maintain favourable conservation condition
European dry heaths	4030	Maintain favourable conservation condition
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430	Maintain favourable conservation condition
Petrifying springs with tufa formation (Cratoneuron)*	7220	Maintain favourable conservation condition
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	91A0	Restore favourable conservation condition

Qualifying Habitats (*denotes Priority Habitat)	Code	Site Specific Conservation Objective
Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)*	91E0	Restore favourable conservation condition

Table 4-3: Qualifying Annex II Species for the River Barrow and River Nore SAC

Qualifying Species	Species Name	Code
Mammals listed on Annex II of the Habitats Directive	Otter *(Lutra lutra)*	1355
Molluscs listed on Annex II of the Habitats Directive	Freshwater pearl mussel (*Margaritifera margaritifera*)	1029
	Nore Freshwater pearl mussel (*Margaritifera durrovensis*)	1990
	Desmoulin's whorl snail (*Vertigo moulinsiana)*	1016
Crustaceans listed on Annex II of the Habitats Directive	White-clawed crayfish (*Austropotamobius pallipes)*	1092
Fish listed on Annex II of the Habitats Directive	Salmon (*Salmo salar)*	1106
	Sea Lamprey (*Petromyzon marinus*)	1095
	Brook Lamprey (*Lampetra planeri*)	1096
	River Lamprey *(Lampetra fluviatilis)*	1099
	Twaite Shad *(Alosa fallax)*	1103
Flora listed on Annex II of the Habitats Directive	Killarney Fern (*Trichomanes speciosum)*	1421

4.2 River Nore SPA (Site Code: 004233)

The River Nore SPA is a long, linear site that includes the following river sections: the River Nore from the bridge at Townparks, (north-west of Borris in Ossory) to Coolnamuck (approximately 3 km south of Inistioge) in Co. Kilkenny; the Delour River from its junction with the River Nore to Derrynaseera bridge (west of Castletown) in Co. Laois; the Erkina River from its junction with the River Nore at Durrow Mills to Boston Bridge in Co. Laois; a 1.5 km stretch of the River Goul upstream of its junction with the Erkina River; the Kings River from its junction with the River Nore to a bridge at Mill Island, Co. Kilkenny. The site includes the river channel and marginal vegetation.

The River Nore SPA is designated under the E.U. Birds Directive of special conservation interest for Kingfisher (*Alcedo atthis).* A survey conducted in 2010 identified 22 pairs of Kingfishers within the SPA (NPWS, 2011).

Qualifying Annex I Species of Birds for River Nore SPA

The River Nore SPA is designated under the E.U. Birds Directive of special conservation interest for Kingfisher (*Alcedo atthis).* The Qualifying Annex species of bird for is Kingfisher (*Alcedo atthis*), code A229.

4.3 Conservation Objectives

European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as Special Areas of Conservation and Special Protection Areas. The Irish Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and,
- The conservation status of its typical species is favourable as defined below.

The favourable conservation status of a species is achieved when:

- Population data on the species concerned indicate that it is maintaining itself;
- The natural range of the species is neither being reduced or 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 full report for the conservation objectives for the River Barrow and River SAC[1] and the River Nore SPA[2] can be found on the NPWS website.

[1] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002162.pdf
[2] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004233.pdf

5 STUDY RESULTS

5.1 Desk-Based Study Results

Table 5-1 provides a summary of records of legally protected or otherwise notable species that occur within a 2km grid square of the site boundary (NBDC, 2020).

Table 5-1: Protected and / or Notable Species within a 2km Grid Square of the Site

Common Name	*Scientific Name*	Date of last record	Designation
Terrestrial			
European Otter	*Lutra lutra*	11/11/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and IV
Common Kingfisher	*Alcedo atthis*	08/05/2014	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Bird Species Birds of Conservation Concern Amber List

Note: Table includes records of protected species recorded within the last 10 years.

5.1 Field Studies Results

The following section provides details of the field-based assessments that were undertaken for the Site between October 2019 and July 2020.

The distribution of the habitats and target notes identifying the location of features of interested are shown in Figure 5-1.

5.1.1 Habitat Survey

Site Context and Surrounding Habitats

The Site is primarily covered in concrete slabs following the removal of the former Smithwick's brewery buildings in 2015. The Maturation Building is located within the Site as a prominent feature.

At the time of the surveys, the Site was being used as part of a construction compound for the Riverside Gardens Project. The Site is therefore currently subject to disturbance associated with these construction activities.

The following habitats were identified using Fossitt's Guide to Habitats (2000) within the Site and immediate surroundings (See Figure 5-1).

Buildings and Artificial Surfaces (BL3)

The majority of the Site is comprised of concrete slabs and is devoid of vegetation. Recolonising species have begun occupying the crevices between the concrete slabs. These species include, grasses, butterfly bush (*Buddleja davidii*), yarrow (*Achillea millefolium*), dandelion (*Taraxacum vulgaria*), common field-speedwell (*Veronica persica*), bramble (*Rubus fructicosus*), ragwort (*Jacobaea vulgaris),* bull thistle *(Cirsium vulagre),* fireweed (*Epilobium angustifolium)* and red valerian (*Centranthus ruber)*.

Multiple stands of the invasive species Himalayan balsam (*Impatiens glandulifera*) were also identified along the northern and eastern boundary of the Site on and adjacent to the concrete slabs (Figure 5-1, TN2).

Three buildings are located within the proposed development boundary, the Maturation Building, the Tasting Room and a small building close to the southern boundary.

The Maturation building is scheduled for demolition and the demolition has been approved by Kilkenny County Council (Reference P8/11-19). The screening for an AA of the demolition concluded that the demolition would have no significant effect on any European site and therefore would not adversely affect the integrity of any European site. The conclusions of this assessment are adopted for the purposes of this NIS.

The Maturation Building is a single storey concrete building which formed part of the brewery process at the Site. This building is a derelict building and devoid of vegetation.

Also, the Tasting Room is a single storey stone structure located adjacent the southern aspect of St Francis Abbey, and is currently used for meeting purposes.

The small building to the south of the site is a small c.2m by 3m single store prefabricated structure.

St. Francis's Abbey, which is located within the area of the Site as a prominent feature, is surrounded by protective fencing and is excluded from the Planning Application.

Multiple tree and hedge species were noted adjacent to the Abbey and the Tasting Rooms including, Norway maple (*Acer platanoides*), weeping willow (*Salix babylonica*), sycamore (*Acer pseudoplatanus*), weigela species (*Weigela spp.*), laurel (*Prunus lusitanica*) and blackberry (*Rubus bifrons*).

Scrub / Treeline (WS1 / WL2)

A scrub / treeline bounds the Site along the eastern perimeter. This scrub / treeline separates the concrete area of the Site from the River Nore. The species identified within this habitat included willow spp. (*Salix spp.*), alder (*Alnus glutinosa*), field maple (*Acer campestre),* horse chestnut (*Aesculus hippocastanum),* ash (*Fraxinus excelsior),* elder (*Sambucus nigra)*, hawthorn (*Crataegus monogyna),* balsam poplar (*Populus balsamifera),* dogwood (*Cornus spp.)*,and oak (*Quercus*).

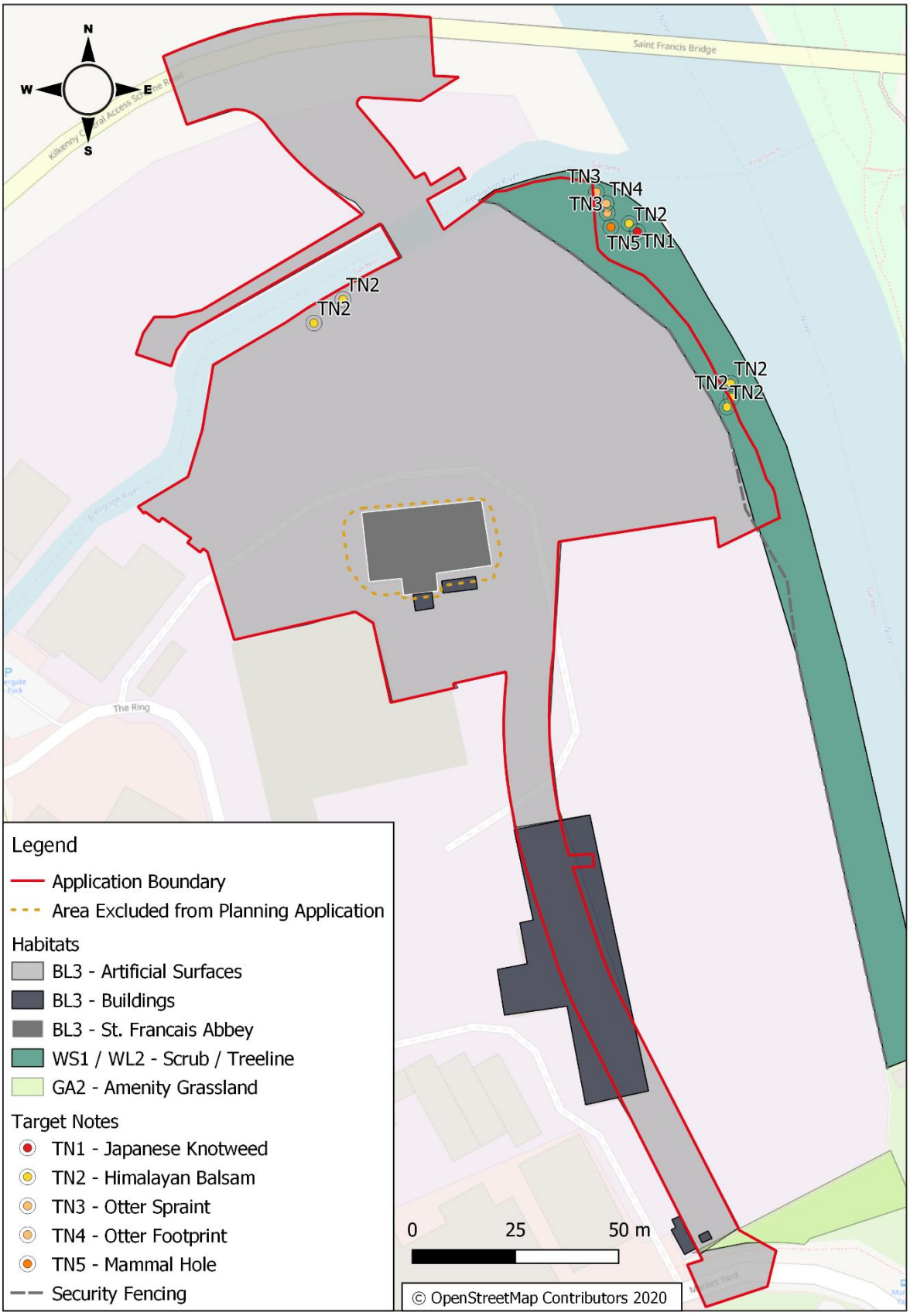
The understory included species such as ivy (*Hedera helix*), ragwort, bramble, butterfly bush, colt's foot (*Tussilago farfara*), St. John's worts (*Hypericum calycinum),* dandelion, common field-speedwell and creeping buttercup (*Ranunculus repens*).

Invasive species, such as Himalayan balsam (Figure 5-1, TN2) and Japanese knotweed (*Fallopia japonica*) (Figure 5-1, TN1), were also identified within the understory.

Amenity Grassland (GA2)

The southern boundary of the Site overlaps a small area of amenity grassland. This grassland had been cut and heavily managed.

Figure 5-1: Habitat Map



5.2 Fauna

5.2.1 Aquatic Species

The survey identified the following habitats and species within the survey area. The survey methodology employed during the aquatic surveys along with detailed results can be found in Appendix B:

- *Callitricho-Batrachion* vegetation was the only designated habitat identified during the survey and was situated within the River Nore downstream of the Site;
- No Nore freshwater pearl mussels were identified;
- A single moribund white-clawed crayfish within the Nore was identified, which was confirmed to be infected by crayfish plague;
- Two Atlantic salmon parr were also identified in the kick-sample in the River Breagagh;
- No suitable nursery or spawning areas for salmon were identified within the vicinity of the Site, although suitable nursery and spawning sites are known downstream of the Site; and,
- The presence of juvenile lamprey was confirmed in sand / silt deposits by the riverbank, downstream of the Site, within the River Nore.

Furthermore, given the fact that the Site is 30km upstream of the nearest record of Twaite shad within the Nore catchment, it was considered that the surveyed area was not suitable for Twaite shad, (Rooney, O'Gorman, Cierpial, & J.J., 2014).

5.2.2 Otter

Evaluation

The evaluation considered information about the characteristics of the species' population and its distribution, the availability of suitable habitats, and the findings of the field studies.

Otter Habitat Preference

Otters are predominantly found in aquatic habitats along rivers, estuaries, canals and in still water bodies such as lakes. An individual otter usually maintains multiple Holts and Couches within its territory, which can extend up to 15km. Holts are located underground and can take many forms, they use natural crevices, associated with the roots of trees that grow along the river and lake banks or use burrows previously made from other animals. A holt will typically have multiple entrances which will allow otters the opportunity to escape when disturbed. Couches are resting places above ground.

Otter can breed year-round, but primarily give birth in the spring and summer months with broods consisting of 2-3 cubs.

Otters are nocturnal animals and can be described as crepuscular. At night and in dark / silty water, the otter relies on their highly sensitive whiskers which detect their prey. In clear waters they utilise their strong eyesight to locate prey usually along the bottom of the waterbodies. Otters are described as opportunistic predators with a broad varied diet, such as salmonids, eel, small fish species and invertebrate.

Otter Survey Results

The otter survey identified spraints (TN3) and footprints (TN4) along the bank of the River Nore adjacent to the Site. Refer to Figure 6-3.

The otter survey conducted on the 20th of March 2020 identified evidence of otter, including spraints (TN3) and footprints (TN4) (see Figure 5-2).

The survey also identified the presence of a large mammal hole at the confluence between the River Breagagh and the River Nore (TN5).

Full details of the otter survey results are found in Figure 5-2 and Table 5-2.

Figure 5-2: Otter Survey Results

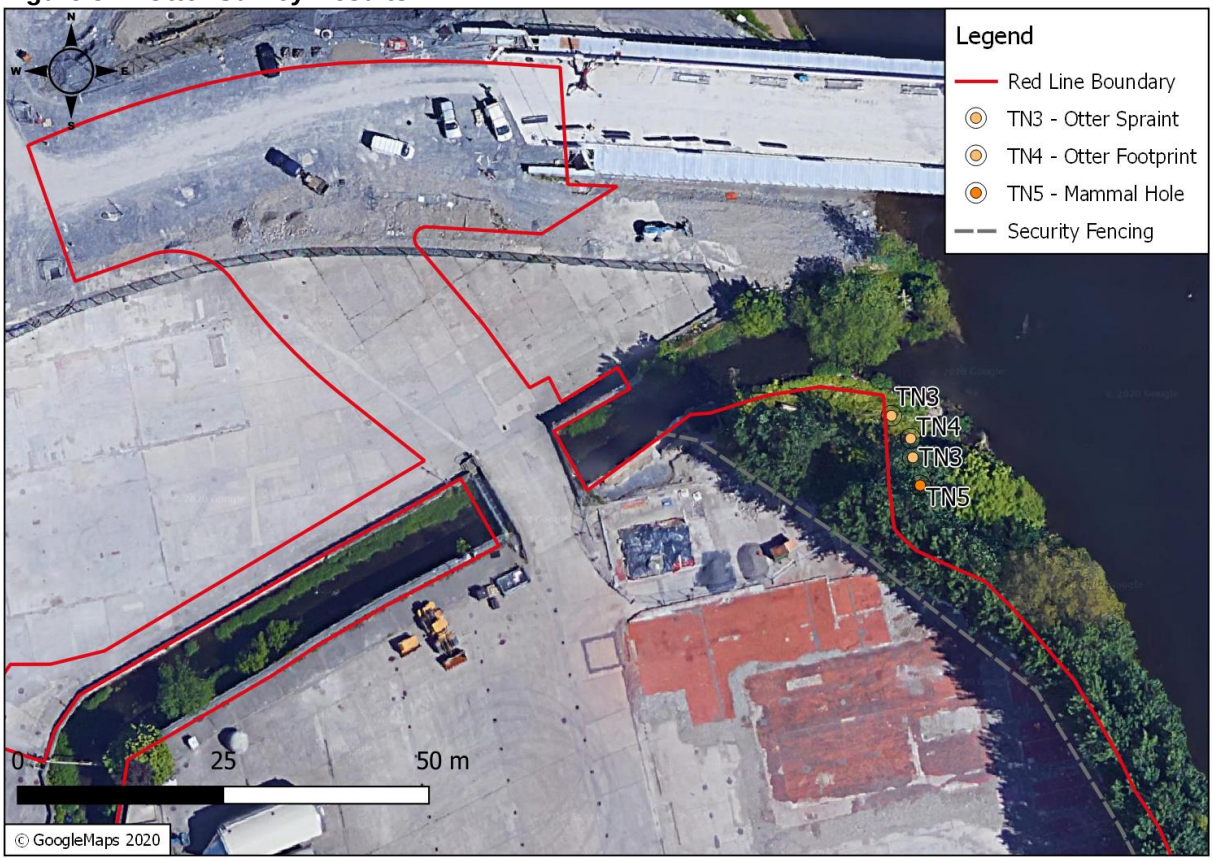


Table 5-2: Otter Survey Results

Section	Recent Weather	Otter Signs Recorded During the Survey					Habitat		Disturbance	Other Notable Species
		Otter Sighting	Spraints	Fresh/ Recent/ Old	Tracks	Holt / Couches	Habitat Description	Evaluation		
River Nore	Sunny and cold (3-10°C), no recent showers.	0	1	Recent	2	0	Slope of the banks range from steep banks downstream to flatter lower banks upstream. Sections of bare earth banks present along parts of the River Nore. Dense riparian vegetation cover, that becomes heavier further downstream. Slow to Moderate river flow and substrate comprising of both silty and stony patches.	Optimal for commuting, foraging and holt / couch construction	Impairment of water quality Noise Disturbance	N/A
River Breagagh	Sunny and cold (3-10°C), no recent showers.	0	0	N/A	0	0	Steep concrete and stone walls with limited riparian vegetation cover. Moderate to fast river flow and substrate comprising of both silty and stony patches.	Optimal for commuting and foraging otter Sub-optimal for holt / couch construction	None	N/A

Camera Trap Survey Results

The camera trap did not capture any otter activity and did not capture otter utilising the mammal hole. The camera trap survey confirmed that this hole was being used by a red fox (*Vulpes vulpes*).

Habitat Suitability

The NBDC holds multiple records for otter within 2km of the Site (NBDC, 2020). The desktop study and initial habitat survey identified suitable habitat for otter within the River Breagagh and the River Nore bordering the Site.

During the otter survey, evidence of otter activity included footprints and spraints were identified, and the aquatic survey undertaken by Sweeney Consultancy identified a number of suitable prey species within both the River Nore and River Breagagh (Appendix B).

It is considered that the River Breagagh and River Nore have the potential to support foraging and commuting otters.

5.2.3 Kingfisher

Evaluation

The evaluation considered information about the characteristics of the species' population and its distribution, the availability of suitable habitats, and the findings of the field studies.

Kingfisher Habitat Preference

Kingfishers are predominantly found along rivers, canals and at still water bodies such as lakes and ponds. They nest in a deep tubular tunnel and they lay eggs between late March and July (Weather dependant) with broods consisting of 5-8 eggs. There are typically 2-3 broods per season.

Kingfisher excavate nests into the stone-free sandy soil of a low stream bank, generally about 0.5m from the top. The banks will generally comprise of a vertical bank, clear of vegetation. These locations are chosen by kingfisher as they provide protection from predators. The nest tunnels are generally 60-90 cm long, and 6 cm in diameter.

Typically, kingfisher construct nests along the banks of streams, tributaries to major watercourses and main riverbanks. However, less common nest sites can include the banks of ditches, reservoir embankments and the sides of canals, lakes and farmland pools. Kingfishers have also been identified nesting in unusual nest sites such as holes located in walls, underneath bridges and concrete tunnels in canal banks have been (Morgan & Glue, 1977).

Trees with branches overhanging rivers provide important fishing perches for kingfisher. The kingfisher relies on its very sensitive sight to hunt fish and is hampered by very turbulent or turbid water. Branches overhanging areas of slack water where there is improved visibility and also where fish congregate are important features for kingfisher.

Kingfisher Survey Results

The kingfisher survey conducted on the 20th March 2020 identified evidence of kingfisher commuting and foraging along the River Breagagh within the Kingfisher Survey Area (Figure 2-2 and Table 5-3). However, the survey did not identify evidence of breeding kingfisher or suitable nest sites within the Site boundary or the surveyed area.

Table 5-3: Kingfisher Survey Results

	Description of Section / Habitat Features							Kingfisher Signs Recorded During the Survey		Section Suitable or Unsuitable for	
Section	**Water Quality**	**River Flow**	**Angle of Bank**	**Bank Substrate**	**Bankside Agricultural Improvement**	**Availability of Overhanging Branches**	**Level of Disturbance**	**Kingfisher Sighting**	**Nest**	**Foraging / Commuting**	**Nesting**
River Breagagh	Clear	Rapid	90	Stoney / concrete and Vegetated in patches	Bank side habitat not improved	No branches but one pipe was overhanging the Breagagh	Urban area in Kilkenny City – nearby construction works, nearby roadway	3	None	Yes	Unsuitable

Habitat Suitability

Following the kingfisher survey, it was concluded that the area surveyed is considered sub-optimal for nesting kingfisher due to the fact that the River Breagagh was predominantly channelled via concrete and stone walls. In addition, the area of stone / concrete walls adjacent to the Site had minimal vegetation and no holes suitable for nesting were identified.

Considering the fact that kingfisher have a preference for creating nest burrows in sand banks with little to no stones it is concluded there are currently extremely limited opportunities for nesting sites along this section of the River Breagagh, specifically the sections directly adjacent to the proposed works areas. In addition, it should be noted that the habitats on-site and within the vicinity of the Site are comprised predominantly of built land and artificial surfaces which are considered sub-optimal for this species.

However, the area surveyed does provide suitable habitat for commuting and foraging kingfisher as evident by the sighting of foraging kingfisher within the River Breagagh. Given that kingfisher are territorial and their territories can range in size from 1km of a river to 5km (RSPB, 2020), there is potential for kingfisher breeding along the River Nore to utilise section of the River Breagagh adjacent to the Site for foraging and commuting.

6 STAGE 1 SCREENING: IDENTIFICATION OF POTENTIAL ADVERSE EFFECTS

6.1 Potential Adverse Effects

Potential adverse effects, if any, on the River Barrow and River Nore SAC and the River Nore SPA were considered further in this section. The key output of this stage of the assessment was the identification of the types of threats to the integrity of the Natura 2000 sites as a result of implementing the proposed development.

A number of factors were examined at this stage and dismissed due to the very low risk associated with them. Table 6-1, Table 6-2 and Table 6-3 present further details and rationale of the screening assessment undertaken for each of the qualifying interests of each of the Natura 2000 sites identified as having the potential to be adversely affected.

These factors were screened in or out, based on whether or not it was concluded that they are likely to be affected by the proposed development if no mitigation measures were applied, and if progression to Stage 2 is required. The rationale for these conclusions is based on results from the aforementioned desk study, literature search and field survey results.

Table 6-1: Screening Assessment: Annex 1 Habitats - River Barrow and River Nore SAC

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
Estuaries	The Conservation Objectives Report (NPWS, 2011) show that this habitat is not present in the immediate vicinity of the Site. The nearest habitat is located approximately 22km south - east of the Site.	N/A	It is considered highly unlikely that the works will have any significant direct or indirect negative effects on this habitat during either the construction or operational phase of the development. This conclusion is based on the absence of this habitat within the proposed Site boundary and the distance separating this habitat from the Site. It is considered highly unlikely that any potential pollutants could reach this habitat due to the fact that pollutants will either be diluted within the watercourse, or pollutants, such as sediment, will settle to the bottom of the watercourse. In addition, there will be no direct discharge into any watercourses during the construction and operational phases of the proposed development. Nonetheless, water quality mitigation measures will be implemented as part of the proposed works and therefore no likely significant effects are considered likely during either construction or operation. This habitat can therefore be screened out and no further assessment required.	**Screened Out**
Mudflats and Sandflats not covered by seawater at low tide	The Conservation Objectives Report (NPWS, 2011) show that this habitat is not present in the immediate vicinity of the Site. This habitat is limited to the intertidal reaches of the River Barrow and River Nore with nearest habitat in excess of 25km south - east of the Site.	N/A	As Above	**Screened Out**
Salicornia and other annuals colonizing mud and sand	The Conservation Objectives Report (NPWS, 2011) show that this habitat is not present in the immediate vicinity of the Site. This habitat is limited to the intertidal reaches of the River	N/A	As Above	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
	Barrow and River Nore with nearest habitat in excess of 25km south - east of the Site.			
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	The Conservation Objectives Report (NPWS, 2011) show that this habitat is not present in the immediate vicinity of the Site. This habitat is limited to the intertidal reaches of the River Barrow and River Nore with nearest habitat in excess of 25km south - east of the Site.	N/A	As Above	**Screened Out**
Mediterranean salt meadows (*Juncetalia maritimi*)	The Conservation Objectives Report (NPWS, 2011) show that this habitat is not present in the immediate vicinity of the Site. This habitat is limited to the intertidal reaches of the River Barrow and River Nore with nearest habitat in excess of 25km south - east of the Site.	N/A	As Above	**Screened Out**
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	The Conservation Objectives Report (NWPS, 2011) show that this habitat is not present in the immediate vicinity of the Site. The nearest habitat is located approximately 17km south - east of the Site.	N/A	As Above	**Screened Out**
Petrifying springs with tufa formation (*Cratoneurion*)	The Conservation Objectives Report (NWPS, 2011) show that this habitat is not present in the immediate vicinity of the Site. The nearest habitat is located approximately 18.5km south - east of the Site.	N/A	As Above	**Screened Out**
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	The distribution of this habitat within this SAC is currently unknown, however, the habitat assessment conducted by MOR did not identify this habitat within or adjacent to the Site. The habitat is likely to occur in association with some riverside woodlands, unmanaged river islands and in narrow bands	N/A	As Above	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
	along the floodplain of slow-flowing stretches of river (NPWS, 2011).			
European dry heaths	The distribution of this habitat within the SAC is currently unknown, however, the habitat assessment conducted by MOR did not identify this habitat within or adjacent to the Site.	N/A	As Above	**Screened Out**
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)**	The Conservation Objectives Report (NWPS, 2011) show that this habitat is not present in the immediate vicinity of the Site. The nearest habitat is located approximately 2.75km south - east of the Site.	N/A	Given the presence of this habitat downstream of the development area, there is potential in the event of a major pollution event for this habitat to be impacted. However, given the water mitigation measures that will be implemented, no likely significant effects are considered during either construction or operation of the proposed development. This habitat can therefore be screened out and no further assessment will be required.	**Screened Out**
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho - Batrachion* vegetation	The distribution of this habitat throughout this SAC is currently unknown (NWPS, 2011). The aquatic surveys conducted by Sweeney Consultants did not identify this habitat within or adjacent to the Site. However, the surveys did identify this habitat in the River Nore downstream of the Site.	**Main / Possible threats to the habitat include:** • Effects associated with pollution during the construction works- Decrease in water quality	Given the identification of this habitat in the River Nore downstream of the Site it is considered that there is potential in the event of a major pollution event for this habitat to be adversely impacted. The proposed water mitigation measures that will be implemented (Section 7.2) will ensure no adverse significant effects are caused during either construction or operation.	**Screened In**

Table 6-2: Screening Assessment: Annex 2 Species – River Barrow and River Nore SAC

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
Otter	Large river catchments including the River Barrow and River Nore catchment are considered to be among the more important SAC's for otter. The NBDC holds several records for otter within close proximity to the Site with recent records (2017) for this species within a 2km boundary of the proposed Site (NBDC, 2020). The otter survey identified otter footprints and spraints along the River Nore, adjacent to the Site. Similarly, there is potential for otters to utilize the River Breagagh for both foraging and commuting purposes given it is a tributary of the River Barrow and River Nore SAC.	**Main / Possible threats to the species include:** • Effects associated with pollution during the construction works - Decrease in water quality • Noise disturbance • Light disturbance during the operational stage	Otters utilising the river in close proximity to the Site have the potential to be temporary affected by disturbances caused by this project.	**Screened In**
Sea Lamprey	The NBDC holds records for sea lamprey within the River Nore catchment (NBDC, 2020). Although there are no records held by NBDC for the species within a 2km of the proposed Site, the aquatic survey identified areas in the River Nore as suitable for lamprey spawning. Similarly, the aquatic survey confirmed the presence of juvenile lamprey within the sand / silt deposits of the River Nore.	**Main / Possible threats to the species include:** • Impacts associated with pollution during the construction works - Decrease in water Quality	Given the presence of this species within the River Nore catchment, and the confirmed presence of juvenile lamprey within the River Nore, it is considered that there is potential for the proposed development to have adverse effects on this highly sensitive species in the absence of appropriate mitigation measures should pollutants enter the watercourse. Site specific mitigation as well as compliance with standard pollution prevention guidance is required to and will ensure that the proposed works do not have an impact on this species during the construction works.	**Screened In**
Brook Lamprey	The NBDC holds records for brook lamprey within the River Nore catchment (NBDC, 2020), however, there are no records held by NBDC for the species within a 2km of the proposed Site.	As Above as per sea lamprey.	As per sea lamprey.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
	The 2017 surveys (Conservation Services, 2017) identified a single brook / river lamprey within the lower sections of the survey area. The survey identified the majority of the surveyed habitats as being poor for both spawning and as nursery habitat for lamprey. Adult Brook Lamprey were encountered in the Nore main channel between Abbeyleix and Ballyragget (Kurz, I. & Costello, N.J, 1999). The aquatic survey identified areas in the River Nore as suitable for lamprey spawning. Similarly, the aquatic survey confirmed the presence of juvenile lamprey within the sand / silt deposits of the River Nore.			
River Lamprey	The NBDC holds records for river lamprey within the River Nore catchment (NBDC, 2020), however, there are no records held by NBDC for the species within a 2km of the proposed Site. The 2017 surveys (Conservation Services, 2017) identified a single brook / river lamprey within the lower sections of the survey area. The survey identified the majority of the surveyed habitats as being poor for both spawning and as nursery habitat for lamprey. the aquatic survey identified areas in the River Nore as suitable for lamprey spawning. Similarly, the aquatic survey confirmed the presence of juvenile lamprey within the sand / silt deposits of the River Nore.	As Above as per sea lamprey.	As per sea lamprey.	**Screened In**
Atlantic Salmon (*Salmo salar*)	The freshwater sections of the River Nore is designated salmonid water under the EU Freshwater Fish Directive, with the upper stretches of the Barrow and Nore particularly the Owennass River are very important for spawning (NPWS, 2011).	As Above as per sea lamprey.	As sea lamprey.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
	The NBDC holds records for Atlantic salmon within the River Nore catchment (NBDC, 2020). A survey undertaken in 2017 identified the Q-score ratings of Q2-3 for the surveyed sections of the River Breagagh indicate poor ecological water quality (Conservation Services, 2017). Poor water quality rating of Q3 is regarded as the borderline for survival of salmonid fish. It was concluded that salmonids would either absent or present at very low densities in this section of the Breagagh (Conservation Services, 2017). The report did however note that the lower reaches of the Breagagh provide habitat that is considered to be suitable as nursery and spawning habitat. During the 2019 aquatic surveys, two Atlantic salmon parr were identified in the kick-sample in the River Breagagh and suitable nursery and spawning sites are known in the River Nore downstream of the Site; however, no suitable nursery or spawning areas for salmon were identified within the vicinity of the Site.			
White-clawed crayfish	No crayfish were recorded during the invertebrate survey for the EIS in 2008 or during a 2014 Ecofact survey (Ecofact, 2014). The survey noted that the habitats at the Site are considered to be of a poor quality for crayfish. The 2017 survey did not identify any crayfish within this section of the Breagagh and concluded that that there was no significant likelihood of these species occurring (Conservation Services, 2017). The 2019 survey did identify a moribund white-clawed crayfish within the Nore; however, it was later confirmed to be infected by crayfish plague. Lucey (Lucey. J, 1999) describes crayfish as 'common' in the Nore system; however, he subsequently reported an "*unexplained collapse of the Nore crayfish population*	As Above as per sea lamprey.	As per sea lamprey.	**Screened In**

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
	occurring in August 2004." (Clabby, K.J. et al, 2005). Demers *et al* (2005) reported "*large, unexplained mortalities of crayfish in the River Nore (Co. Laois) in August 2004*". Reynolds (2007) states that stocks are "*apparently diminishing in upper mainstream* (Nore)." The NBDC hold records for white-clawed crayfish within the River Nore catchment (NBDC, 2020). However, there are no records held by NBDC for the species within a 2km boundary of the proposed Site, with the nearest record approximately 2.95km east of the Site (NPWS, 2011).			
Freshwater pearl mussel	This species is confined to 14 km of the main channel of the Nore; (Moorkens, E.A., 1991) (Moorkens, E.A., 1995). The main concentration of this species in the Nore is in the Durrow region; however, this species have also been recorded in the section of the river between Ballyragget and the confluence with the Nuenna River (Moorkens, E.A., 1999) The NBDC holds records for Freshwater pearl mussel within the River Nore catchment. However, there are no recent records held by NBDC for the species within a 2km boundary of the Site. The nearest record of this species is located 16.5km NW of the Site (NPWS, 2011). This species was not recorded at or adjacent to the site during the 2014 surveys conducted by Ecofact (Ecofact, 2014). The 2017 survey did not identify this species within the River Breagagh, and this river is not considered suitable for this species (Conservation Services, 2017). The 2019 aquatic survey did not identify any freshwater pearl mussels.	N/A	This species is very sensitive to water quality and any impacts on water quality could adversely impact this species. However, given the absence of this qualifying species within 2km boundary of the Site and the lack of suitable habitat in the vicinity of the Site, as concluded by the aquatic surveys, it is considered highly unlikely that the works will have any significant negative impact on this species during either the construction or operational phase of the proposed development. Furthermore, this species is not known to occur within the River Nore downstream of the River Breagagh tributary. This species can therefore be screened out and no further assessment required.	**Screened Out**
Twaite Shad	The NBDC holds records for Twaite shad within the River Barrow catchment, which is directly linked to the River Nore (NBDC, 2020). This species was also recorded in	As Above as per sea lamprey.	As per freshwater pearl mussel	**Screened Out**

Qualifying Feature of Interest	Baseline	Potential Adverse Effects	Screening Rationale	Screening Conclusion
	the Lower River Suir and River Barrow and Nore estuary in 2013 by Inland Fisheries Ireland (DEHLG, 2007).			
Nore Freshwater pearl mussel	The Nore Freshwater Pearl Mussel is confined to 14 km of the main channel of the Nore (Moorkens, E.A., 1991) (Moorkens, E.A., 1995). The main concentration of the Nore freshwater pearl mussel in the Nore is in the Durrow region; however, the Nore freshwater pearl mussel have also been recorded in the section of the river between Ballyragget and the confluence with the Nuenna River (Moorkens pers. comm. 1998). The NBDC holds records for Nore freshwater pearl mussel within the River Nore catchment (NBDC, 2020). However, there are no recent records held by NBDC for the species within a 2km boundary of the Site. The nearest record of this species is located 16.5km NW of the Site (NPWS, 2011). This species was not recorded at or adjacent to the site during the 2014 surveys conducted by Ecofact (Ecofact, 2014). The 2017 survey did not identify this species within the River Breagagh, and this river is not considered suitable for this species (Conservation Services, 2017). The 2019 aquatic survey did not identify any Nore freshwater pearl mussels.	N/A	As per freshwater pearl mussel	**Screened Out**
Desmoulins's whorl snail	The NBDC holds no records for this species within 2km of the Site, with the nearest record over 26.5km north west of the Site (NPWS, 2011). The 2019 survey did not identify this species within the study area.	N/A	As per freshwater pearl mussel	**Screened Out**
Killarney Fern	The NBDC holds no records held by NBDC for the species within a 2km boundary of the proposed Site. The nearest record over 25km south east of the Site (NPWS, 2011).	N/A	As per freshwater pearl mussel	**Screened Out**

Table 6-3: Screening Assessment: River Nore SPA

Qualifying Feature of Interest	Baseline	Potential Impacts	Screening Rationale	Screening Conclusion
Kingfisher	The National Biodiversity Data Centre (NBDC) holds recent records (2014) for kingfisher within a 2k grid square of the Site (NBDC, 2020). Recent records (2014) for this species exist within a 2km boundary of the proposed Site (NBDC, 2020). During the survey, no potential nesting sites were identified within the study area, however, foraging and commuting along the River Breagagh and the River Nore. The Site and the on-site habitats are considered to be sub-optimal for this species. It is however considered likely that this species will commute and forage along this section of the river in order to access more suitable nesting habitat both further up and down the catchment.	**Main / Possible threats to the species include:** • Impacts associated with pollution during the construction works- Decrease in water Quality • Noise Disturbance	This species is known to occur within the area and utilise the main Nore river channel. However, it is unlikely that the habitats within the Site itself are of significant importance for this species in terms of nesting given the sub-optimal habitat conditions in terms of nesting and foraging and given the levels of disturbance within the area. Nonetheless, given the fact that this species is known to occur within the wider area and has been identified commuting and foraging within the vicinity of the Site there is potential for the species to be adversely impacted by the localised disturbance caused during the construction phase of the project. Pollution of the water course could adversely impact fish species within the river which is the kingfisher's source of food. It is considered that, in the absence of adequate mitigation measures, Kingfisher in the area may temporarily impacted by the works.	**Screened In**

7 STAGE 2: ASSESSMENT OF POTENTIAL ADVERSE EFFECTS

This section provides recommendations for measures which will mitigate against any potential adverse effects of the proposed works on qualifying habitats and species throughout the duration of the project. The following effects with potential to adversely affect the conservation objectives of the identified Natura 2000 sites were identified and considered:

- Loss of, or disturbance to habitats or species;
- Potential impairment of water quality;
- Potential noise disturbance; and,
- Potential light disturbance.

7.1 Loss of, or Disturbance to, Habitats or Species

It has been shown through specialist surveys that a number of designated species for the SAC and SPA occur within the vicinity of the Site or downstream of the Site, as well as one designated habitat for the SAC that occurs downstream of the Site.

Although no works will be undertaken within the River Nore, it is considered that there is a potential for works in the absence of mitigation measures to temporarily disturb designated species and habitats in the vicinity of the Site.

Otter

The otter survey identified otter footprints and spraints in the vicinity of the Site along the River Nore. However, given the small scale nature of the works, the history of industrial use of the Site and the fact that the Site is located within Kilkenny City, it can be assumed that otter using the habitats within the vicinity of the Site will be habituated to levels of human activity and anthropogenic noise. Nonetheless, mitigation measures will be put in place in order to minimise potential disturbances from affecting otter, that will include:

- A confirmatory pre-construction survey will be carried out to check for otter holts within or close to the works areas. Based on the dynamic nature in otter breeding sites and locations along with the likely timeframe between the otter survey date and the date upon which approval for planning may be granted, a confirmatory pre-construction survey will be undertaken;
- Defence planting and fencing will be installed along the boundary of the park;
- Where excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed;
- No construction works will take place outside of daylight hours during the site clearance works, the appointed project ECoW will be consulted as required; and,
- If unidentified burrows are identified within the works area during construction, the project ECoW will be contacted for advice.

It can therefore be concluded that compliance with the mitigation measures will ensure that the proposed development will not result in any significant adverse effects (including disturbance) on otter within the vicinity of the Site.

Kingfisher

Based on the kingfisher survey undertaken by MOR ecologists, it was concluded that the on-site habitats and the habitats within the vicinity of the Site do not provide suitable breeding habitat for kingfisher. However, foraging and commuting kingfisher were identified utilising the River Breagagh.

Therefore, the construction works associated with the proposed development have the potential to result in temporary disturbance for kingfisher, which may result in a temporary

minor loss of feeding habitat as birds move away from the disturbance. However, it should be noted that kingfisher territories can range in size from 1km of a river to 5km (RSPB, 2020). Given the availability of suitable habitats within the wider area it can be concluded that should kingfisher be temporarily displaced during the construction phase, they would only be displaced from one available site to another within the wider network of the kingfishers' territory. This would not be a significant adverse effect.

Furthermore, it should be noted the section of the River Breagagh and the River Nore is located within an urban environment and has a history of human activity on-site. Therefore, it can be concluded that the kingfisher utilising this section of the River Nore SPA have become habituated to higher levels of human activity and anthropogenic noise. and are unlikely to be significantly disturbed.

Fish Species

The specialist aquatic surveys undertaken by Sweeney Consultants identified evidence of a moribund white-clawed crayfish, two Atlantic salmon parr and juvenile lamprey. The surveys identified *Callitricho-Batrachion* vegetation within the River Nore downstream of the Site. Therefore, mitigation measures will be put in place in order to prevent any adverse effects to the water quality of the River Breagagh and the River Nore (see Section 7.2 below).

7.2 Potential Impairment of Water Quality

7.2.1 Construction Phase

Should pollutants from the Site enter the surface water or groundwater and flow into the River Breagagh or River Nore, this could adversely affect the water quality, subsequently impacting on protected habitats and species within the River Barrow and River Nore SAC and the River Nore SPA.

Potential pollutants resulting from the proposed works include suspended solids, cementitious materials, silt, dust or hydrocarbon leaks or spills. If water quality is affected by the proposed developments, this could directly affect otter, kingfisher and fish species within the river or along its margins and possibly indirectly affect these species by impacting on their food supply.

However, it is not considered that pollutants would impact on the water quality of the River Barrow and River Nore SAC and the River Nore SPA. This is based on the localised nature of the proposed works, the fact that the proposed development will utilise the existing bridge, and importantly there will be no in-river works.

Nonetheless, all construction works will be undertaken in accordance with recognised best practice guidance as outlined in Section 3.6 of this report. Also, as a precautionary principle, the following mitigation measures will be put in place, to ensure that water quality is protected within the vicinity of the Site and further downstream. These measures will be put in place to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below. In addition, all works will be undertaken in accordance with all recognised best practice guidelines.

These procedures will be communicated to all relevant site staff. The following best practice guidelines will be followed, which are based on Inland Fisheries Ireland (IFI, 2016) and National Roads Authority (NRA), now known as the Transport Infrastructure Ireland (TII), (NRA, 2005) guidance documents:

- Construction stage works will be undertaken in accordance with an approved CEMP;
- All plant and machinery will be serviced before being mobilised to the Site;
- All oil stored on the Site for construction vehicles will be kept in a locked and bund protected area;

- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Refuelling of plant and machinery will be completed in a controlled manner using drip trays (bunded container trays). Fuel containers will be stored within a secondary containment system, e.g. bunds for static tanks or a drip tray for mobile containers. Bunds for the storage of hydrocarbons and chemicals will have a holding capacity of 110% of the volume to be stored;
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- Drip trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel plant on-site;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spill;
- All concrete pours will be carefully planned to avoid any impacts;
- Water supply points, if required, will be agreed with the appointed Contractor in advance of the works;
- Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
- Chemicals used will be biodegradable where possible;
- Any spillages will be cleaned up immediately and disposed of correctly;
- Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
- Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete;
- Surplus concrete will be returned to batch plant after completion of a pour;
- Construction works within close proximity of the River Breagagh and River Nore will be subject to inspections by a suitably qualified environmental consultant;
- Existing fuel / oil interceptors will be maintained until they are ready to be replaced;
- The installation of new oil / silt interceptors will be conducted during dry weather;
- Discharges to the River Breagagh / River Nore will be blocked while the new oil / silt interceptors are being installed so that no discharge from the Site occurs during this time; and,
- Existing drains which are not being used as part of the proposed development will be grouted at both ends and associated gullies will be blocked.

Furthermore, during the demolition and construction works a Dust Management Plan will be implemented in order to minimise any potential adverse effects from dust. This plan will be prepared and submitted to the Planning Authority for agreement in advance of the commencement of works.

Throughout the duration of the works, regular inspections of the River Breagagh and the River Nore will take place in order to ensure that no adverse effects are impacting on the water quality of either waterbody. The monitoring will take place as follows, visual inspection of the River Breagagh and River Nore will be undertaken at the following locations twice daily:

- Upgradient of the Site in the River Breagagh;
- Downgradient of the Site in the River Breagagh;
- Upgradient of the Site in the River Nore; and,
- Downgradient of the Site in the River Nore.

These visual inspections should include a photographic record and notes regarding water quality and works occurring at the time both on the site and in the vicinity of the observation points.

Daily sampling of the River Breagagh / River Nore will be undertaken at the locations outlined above for the following parameters:

- pH;
- Suspended solids; and,
- Oils, Fats and Greases (known as FOG).

This sampling should take place, during the working day, from the time that removal of the concrete slab or drainage works commence, whichever is first. Until all groundworks and concrete works are finished and the new drainage system, including oil / water interceptor and silt traps, are fully commissioned. Records of both the visual inspections and surface water analytical results will be submitted to the KCC environmental section.

It is therefore considered that due to these mitigation measures, the best practice guidelines that will be adhered to throughout the works and the monitoring scheme that will be implemented, that there will be no adverse effects on either the surface or groundwater quality of the watercourses in the vicinity of the Site, or on the protected Natura 2000 sites and their designated conservation interests.

7.2.2 Operational Phase

Any discharges to the River Nore have the potential to contaminate the river and indirectly impact upon biodiversity in the SPA / SAC.

However, it is considered unlikely that the proposed development will result in any effects on water quality based on the management of surface water within the proposed Site, which includes the following:

- Run-off from the hardstanding areas of the Site will be collected in a closed drainage system before passing through silt / oil separators and discharging to the River Breagagh and the River Nore;
- Run-off from the soft landscaped areas will drain by infiltration in via cores in existing concrete hardstanding within areas of lawn. The proposed soft landscaping, located over the existing concrete hardstanding, will drain to the soil through the cores; and,
- A drainage board will form part of the landscape build-up over the concrete hardstanding. The purpose of the drainage board is to retain 10-12 litres of water per m^2.

Furthermore, the proposed development will incorporate several landscaped / grassed areas. The inclusion of planted and grass areas, a drainage board within areas of lawn and infiltration holes in soft landscaped areas will result in a reduction of surface water discharge. The design will provide a natural attenuation. Therefore, while it is not proposed to attenuate run-off from the proposed development, there will be an overall reduction of surface water run-off from the proposed development when compared to the existing Site.

It is considered that there is no unacceptable risk to the sensitive receiving water environment associated with the known condition of the Site during the operational phase. It also concluded that there will be no significant impact to the local hydrogeological regime at the Site associated with the proposed development.

It can therefore be concluded that the operational activity at the Site will not have any adverse effect on either the surface water or groundwater quality and will cause no adverse effects to qualifying species of the River Barrow and River Nore SAC and the River Nore SPA.

7.3 Potential Noise Disturbance

7.3.1 Construction Phase

Construction noise sources have the potential to result in temporary adverse effects on the noise levels in the vicinity of the Site. However, it should be noted that during the construction phase of the proposed development, works will be limited to 07:00 to 19:00 hours Monday to Friday and 09:00 to 16:00 hours on Saturday, thereby limiting the noise effects on crepuscular species, such as otter.

As previously mentioned, it can be concluded that both kingfisher and otter within the vicinity of the Site will be habituated to high levels of human activity and anthropogenic noise given the history of developments within the area and the presence of the Site within an urban area. Furthermore, given the availability of suitable habitats within the wider area it can be concluded that should be these species be temporarily disrupted, they will move to a suitable area elsewhere.

It is therefore concluded that any potential increases in noise as a result of the proposed development will not adversely affect these species.

Irrespective of this, mitigation measures will be put in place in order to ensure that there are no adverse effects to designated species due to noise emission. These measures include:

- Management of deliveries and vehicles to minimise vehicles idling on-site;
- Commitments that all plant and equipment will be compliant with SI 241/2006, as amended, for noise rating of construction plant;
- Construction hours will be restricted for activities requiring the operation of noisy plant (i.e. activities likely to result in noise nuisance at NSLs);
- Mechanical plant and equipment used for the purpose of the works will be fitted with effective exhaust silencers and will be maintained in good working order;
- Careful selection of quiet plant and machinery to undertake the required work, where available;
- All major compressors will be 'sound reduced' models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use;
- Any ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers;
- Machines in intermittent use will be shut down when not in use;
- Ancillary plant such as generators, compressors and pumps will be placed behind existing physical barriers, and the direction of noise emissions from plant including exhausts or engines will be placed away from sensitive locations. Where possible, in potentially sensitive areas, acoustic barriers of enclosures will be utilised around noisy plant and equipment;
- Handling of all materials will take place in a manner which minimises noise emissions;
- Audible warning systems will be switched to the minimum setting required by the Health & Safety Executive or the Health & Safety Authority; and,
- The Contractor will adhere to the codes and practices for minimising noise emissions from construction works, including those provided in BS5228:2009, where applicable.

Therefore, subject to compliance with the above measures, it can be concluded that the construction phase of the proposed development will not result in any adverse effects on or significant disturbance of designated species due to noise emissions.

7.3.2 Operational Phase

During the operational phase, given the limited vehicular access, the acoustic character of the Site will be pedestrian in nature. The primary generation of noise will be from the movement of people along and through the street, the use of fitness equipment, the use of the

playgrounds and tourism associated with the inclusion of the church on guided walks of the city. However, it is reasonable to assume that normally the social areas, including the fitness area and playgrounds, will operate during daytime hours only. Outside these hours the main thoroughfare would remain open.

It should be noted that the noise emissions generated during the operation phase will be on a very local scale, and not readily discernible as the character of this street will be significantly quieter than existing road vehicle traffic roads to the north, west and south.

Therefore, it can be concluded that there will be no adverse effects from noise emissions to any designated species or any significant disturbance of them during the operational phase of the proposed development.

7.4 Potential Light Disturbance

During the construction phased, it has been concluded that lighting will not adversely impact any species, given the fact that the works will be limited to the working hours.

However, during the operational phase, in order to reduce potential adverse effects on nocturnal and crepuscular species from light disturbance, a lighting strategy has been prepared for the proposed development. This strategy has been designed to mitigate against potential adverse effects from the security lighting and associated footpaths.

The lighting strategy involves avoiding excessive lighting and ensuring light spillage into the River Nore and River Breagagh from the proposed development does not exceed 1 lux. The lighting strategy has been prepared taking full cognisance of the draft Lighting Review of the lighting scheme that has been prepared for the adjacent Mayfair building redevelopment (Eco Fact, 2020).

Where lighting is essential for safety and security reasons the following measures have be taken into consideration during the layout design:

- Avoidance of excessive lighting;
- Light Emitting Diodes (LED's) will be used and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting will be directed away from landscaped areas, retained sections of vegetation and any waterbodies; and,
- The height of lighting columns has been reduced as much as possible to avoid light spillage.

Following the installation of the lighting for the proposed development, the project ECoW will undertake a further Site inspection, to check the lighting patterns and lux levels along the site boundaries.

Furthermore, the proposed planting that will be undertaken as part of the landscaping for the proposed development will enhance the existing scrub / treeline along the eastern Site boundary and will provide appropriate screening to the River Nore from the proposed lighting, for further details see the Landscape Design Package (Drawing No. 100 - Landscape Masterplan).

7.5 Analysis of 'In-Combination' Effects

The Habitats Directive requires competent authorities to make an appropriate assessment of any plan or project which is likely to have a significant effect alone or in-combination with other plans and projects.

As previously mentioned, at the time of writing, construction works for the Riverside Garden Project, the redevelopment of the Mayfair Ballroom into the City Library and the redevelopment

of the former Smithwick's Brewery Brewhouse building into primarily office space are all ongoing.

Therefore, taking into account the ongoing construction works related to the above-mentioned projects, there is potential for 'in-combination' adverse effects to the designated interests of the River Barrow and River Nore SAC and the River Nore SPA.

However, in 2015, a Natura Impact Report was prepared for the Masterplan for Abbey Creative Quarter, Kilkenny. This document addressed the potential risks to the qualifying interests and conservation objectives of the Natura 2000 sites and recommended mitigation measures for potential adverse effects that cannot be avoided. As part of the Masterplan, all plans and projects will be subjected to Appropriate Assessments (AA) and therefore, each project was assessed for potential adverse effects to the Natura 2000 sites (CAAS Ltd., 2015).

The Riverside Garden Project, the redevelopment of the Mayfair Ballroom project and the redevelopment of the former Smithwick's Brewery Brewhouse building were all subjected to Appropriate Assessments. The AA prepared for the Riverside Gardens concluded that the proposed development would not result in any adverse effects to the Natura 2000 sites (Moore Group, 2015). Similarly, the AA for the redevelopment of the former Smithwick's Brewery Brewhouse concluded that the works would not affect the Natura 2000 sites either directly or indirectly (Moore Group, 2015). Also, the AA undertaken for the redevelopment for the Mayfair Building concluded that there would be no direct or indirect adverse effects on the Natura 2000 sites (Moore Group, 2014), and the updated AA prepared for the redevelopment for the Mayfair Building undertaken in 2019 also found that there would be no direct or indirect adverse effects on the Natura 2000 sites (Moore Group, 2019).

Therefore, given the fact that the ongoing projects will not result in any adverse effects to the Natura 2000 sites and taking into account the small scale and localised nature of the proposed development, the mitigation measures that will be put in place and the best practice guidelines which will be implemented during the construction and operational phase of the development, it is concluded there will not be any significant in-combination contribution by the project to possible adverse effects on the River Barrow and River Nore SAC and the Rive Nore SPA and that it will not cause any adverse effect on the integrity of any European site in combination with other plans and projects.

8 SCREENING CONCLUSIONS AND STATEMENT

A detailed assessment of the layout and nature of the proposed development, the construction methods to be employed and the overall activities that will occur at the Site during construction and operation has been carried out and the potential for adverse effects on Natura 2000 sites and qualifying features of interest within a 15km radius of the Site has been examined in detail.

Two (2No.) designated sites, the River Barrow and River Nore SAC and the River Nore SPA, are located within a 15km radius of the Site. These Natura 2000 sites were taken forward for further detailed consideration given the close proximity to the proposed development Site.

It is considered reasonable to conclude that the proposed development will not result in any adverse effects on the basis that the specific mitigation measures will be implemented. Specifically, the proposed construction works will be undertaken to avoid impairment of water quality.

In terms of significance with regard to adverse effects on Natura 2000 sites, the NPWS Guidance (2009) uses an EC definition as follows:

> *'Any element of a plan or project that has the potential to affect the conservation objectives of a Natura 2000 Site, including its structure and function, should be considered significant (EC, 2006).'*

It can be concluded that the proposed development and all associated site works, alone or in-combination with other projects, will not adversely affect the integrity, and conservation status of any of the qualifying interests of the River Barrow and River Nore SAC and the River Nore SPA or any other Natura 2000 sites.

Accordingly, progression to Stage 3 of the Appropriate Assessment process (i.e. Assessment of Alternatives Solutions) is not considered necessary.

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APPENDICES

APPENDIX A

TREE PLANTING EXISTING

TREE PLANTING NEW

SRHRUB PLANTING NEW

GRANITE PAVING
COLOR - BLACK

GRANITE PAVING 300 X 100X 100 mm
COLOR SILVER AND MID GRAY

GRANITE PAVING 600 X 200X 100 mm
COLOR SILVER AND MID GRAY

CONCRETE SURFACING
WITH EXPOSED AGGREGATE
TO TIE IN RIVER GARDENS PARK

GRANITE COBBLE STONE

CLIPPED HEDGE PLANTING
OF LONICERA PILEATA

COMPACTED GRAVEL SURFACING

PLAYGROUND SAFETY SURFACING

RIVERBANK NATURAL
PLANTING - TIE IN EXISTING PLANTING

PERENNIAL
GROUNDCOVER PLANTING
MINIMUM 400MM TOPSOIL DEPTH

GRASS SEEDING WITH BULBS
MINIMUM 200MM TOPSOIL DEPTH

TIMBER FENCE ALONG RIVER NORE

LINEAR DRAIN

FILTER DRAIN

CIRCULAR DRAIN SLOT

FFL +44.20
+44.20
EXISTING LEVELS

NEW LEVELS

LIGHTING POLE VEELITE VISTA 6M,
BOLLARD LIGHTING
FEATURE LIGHTING ESCOFET FUL

AUTOMATED RETRACTABLE BOLLARDS

STREET SEATS

MOVABLE SCULPTURAL SEATS

BICYCLE STANDS

BINS

PROPOSED PLANNING AREA

AREA OF THE ABBEY CHOIR EXCLUDED FROM PLANNING

NORTH

1:500 @ A1

MITCHELL + ASSOCIATES
LANDSCAPE ARCHITECTURE URBAN DESIGN
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PROJECT
ABBEY QUARTER URBAN PARK AND STREET

CLIENT
KILKENNY COUNTY COUNCIL

JOB NO.
LKIL050

DRAWING
LANDSCAPE MASTERPLAN

DRAWING NO.
100

DRAWN BY	CHECKED	DATE
VERONIKA KUNCLOVA	VK	22.07.2020
STATUS: PLANNING	**SCALE** 1:500 @ A1	**REVISION** 02

NOTES:
All dimensions are in millimeters unless otherwise stated and shall be checked and confirmed by the contractor on site. Any discrepancies shall be immediately reported to the landscape architects. Work to figured dimensions only - Do not scale from drawing. Do Not Scale. Use Figured Dimensions Only. Not for Construction Purposes unless Specifically Marked.

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APPENDIX B

Baseline Aquatic Ecology Study
Abbey Quarter Urban Park and Street, Kilkenny

Revised

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Co. Cork.
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Date: 30 June, 2020

TABLE OF CONTENTS

1. INTRODUCTION

The present report was commissioned by Malone O'Regan Consulting Engineers. It summarises the findings of baseline aquatic surveys, carried out adjacent to and downstream of the proposed Abbey Quarter Urban Park and Street development in Kilkenny City.

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2. DESKTOP REVIEW

The proposed development site is bounded on its eastern side by the River Nore and on its northern side by the Breagagh River. This part of the River Nore channel, but not the adjoining land, is within the River Barrow and River Nore Special Area of Conservation (SAC 002162), designated under the EU Natural Habitats Regulations (Special Areas of Conservation) for the protection of a variety of aquatic and semi-aquatic habitats and species. Some of these are estuarine or only occur in other parts of SAC and are therefore not relevant to the current project.

The possible presence of the following aquatic Qualifying Interests of SAC 002162 warrant further investigation:
Floating River Vegetation (Habitat Code 3260).
Nore Freshwater Pearl Mussel (*Margaritifera m. durrovensis*) (Species Code 1990).
White-Clawed Crayfish (*Austropotamobius pallipes*) (Species Code 1092).
Atlantic Salmon (*Salmo salar*) (Species Code 1106).
Brook Lamprey (*Lampetra planeri*) (Species Code 1096)
Sea Lamprey (*Petromyzon marinus*) (Species Code 1095)
River Lamprey (*Lampetra fluviatilis*) (Species Code 1099).

Because the presence and vulnerability to impacts of protected aquatic species is dependant not only on the physical conditions within the river, but also on the prevailing water quality, the biological water quality of the Rivers Nore and Breaghagh need to be considered.

Within SAC 002162, the Nore freshwater pearl mussel is a sub-species which is known to occur only in a 10km stretch of the main channel of the River Nore upstream of Tallyho Bridge in Co. Laois. However,

individual mussels can be transported downstream in flood conditions and surveying is therefore advisable.

The white-clawed crayfish was formerly abundant throughout much of the River Nore and tributaries (J. Lucey, *pers. comm.*). A decline in the crayfish population was first noted in 2001. Information from local anglers indicates that a considerable kill occurred around this time, with accumulations of dead crayfish reported in areas of slack water in the main channel of the Nore. Low numbers of crayfish have since been recorded in several tributaries and in July 2019, one was found in the upper reaches of the Nore main channel during sampling for the EPA River Monitoring Programme (*pers. obs.*).

The main channel of the River Nore is a Salmonid Water, designated under the European Communities (Quality of Salmonid Waters) Regulations of 1988 (S.I. No. 293 of 1988). Some of the tributaries are important for salmon spawning. However, salmon ideally need EPA Class A water: Q values Q4 to Q5 (Curtis *et al.*, 2009).

Sea lamprey usually spawn in the lower reaches of the River Nore between Thomastown and Inistioge, but sometimes as far up as Ballyragget (Kurz and Costello, 1999). In a survey of the River Nore main channel in 2013, Rooney *et al.* (2014) identified sea lamprey redds at several locations between Bennettsbridge and Inistioge.

Available information indicates that brook and river lampreys are widespread throughout the Nore system. The juvenile stage of these two species are very difficult to tell apart. Adult brook lamprey have been recorded in the Nore main channel between Abbeyleix and Ballyragget and unspecified lampreys have been observed in several of the tributaries (Kurz and Costello, 1999).

3. CONSULTATIONS

Issues relating to fish in the Rivers Nore and Breagagh were discussed with Jane Gilleran, Fisheries Environmental Officer, Inland Fisheries Ireland (IFI), by telephone on 08/08/2019.

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4. FIELD SURVEY

Field work was carried out on 07/08/2019. The deep section of rives adjacent to the subject site was surveyed by boat. Shallow areas were surveyed on foot. To illustrate the general habitat quality, photographs were taken using a digital camera (photographs are presented in Appendix 1). Grid references were recorded using a GPS handset.

4.1 Biological Water Quality

Biological water quality assessments were carried out at two sites, one in Nore and one in the Breagagh, by the Q-scheme methodology (EPA, 2019). As the Nore adjacent to the subject site is deep and unsuitable for this methodology (Photo 1), the sampling was carried out in a stretch of riffle farther downstream at ITM 65148 65777 (Photo 2). As the bed of the Breagagh adjacent to the subject site is lined with gabion mattresses (Photo 3), sampling was carried out just upstream of these mattresses at ITM 65053 65644 (Photo 4). Sampling locations are shown in Appendix 2.

4.2 Qualifying Interest Habitats Assessment Methods

The floating river vegetation habitat was assessed, based on the criteria outlined by Hatton-Ellis and Grieve (2003).

4.3 SAC 002162 and SPA 004233 Qualifying Interest Species Assessment Methods

The status of protected species possibly occurring in the rivers adjacent to and for 1km downstream of the subject site was assessed as follows:

- The presence of the Nore freshwater pearl mussel (*Margaritifera m. durrovensis*) was checked for by a survey carried out under a Stage 1/2 licence (Licence No. C24/2019) from the National Parks and Wildlife Service. The riverbed was searched visually, using a Perspex-bottomed viewer.

- White-clawed crayfish were surveyed for in the Nore and Breagagh under Licence No. C042/2019. Hand search of suitable crayfish refuges in shallow water in proximity to the Q-value sampling sites were carried out following the methodology of Peay (2003).
- The habitat quality for salmon (*Salmo salar*) was assessed, based on the criteria outlined by Kennedy (1984) and by Bardonnet and Baglinière (2000) for the physical instream requirements of this species for spawning, nursery and adult habitat. The contents of the net at Q-value sites was checked immediately after the kick-sampling and any fish species found were identified and immediately returned to the water.
- The habitat quality for of lamprey species, was assessed, based on the criteria outlined by Maitland (1980) and by Johns (2002) for the physical instream requirements of these species for spawning, nursery and adult habitat. Where suitable nursery habitat was found, sand/silt was dredged with a hand-net (mesh size 2mm) to check for lamprey ammocoete presence.
- Records of Twaite shad (*Alosa fallax*) were checked in available literature.

The presence and extent of any invasive alien plant species listed in Part 1 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) was checked for visually.

5. RESULTS

5.1 Biological Water Quality

The Q-values ascribed to the two sites were:

- Breagagh: Q3
- Nore: Q3-4

At both sites assessed, the biological water quality is unsatisfactory and is below the standard which must be achieved in accordance with the European Communities Environmental Objectives (Surface Waters) Regulations 2009.

5.2 SAC 000781 Qualifying Interest Habitats

5.2.1 Floating River Vegetation (Habitat Code 3260).

Downstream of the weir the River Nore supports vegetation that could be classified as being of the Callitricho-Batrachion vegetation habitat type (Photo 5).

5.3 SAC 000781 Qualifying Interest Species

5.3.1 Nore Freshwater Pearl Mussel (*Margaritifera m. durrovensis*) (Species Code 1990).

No mussels were found.

5.3.2 White-Clawed Crayfish (*Austropotamobius pallipes*) (Species Code 1092).

A single moribund crayfish was found in the Nore (Photo 6). This specimen was sent to the Marine Institute, where crayfish plague was confirmed. This was the first confirmed case of crayfish plague in the Nore catchment (although it is suspected that there was an outbreak that went undetected in 2000). The possibility of live crayfish in the rivers adjacent to the subject site when works commence is highly unlikely, but the spores of the microorganism that causes plague could be present.

5.3.3 Atlantic Salmon (*Salmo salar*) (Species Code 1106).

The River Nore contains suitable physical habitat for salmon spawning and nursery downstream of the weir, but not adjacent to the subject site, where the river has been dredged. However, adult salmon must migrate upstream past the site and salmon parr must migrate downstream. In the kick-sample in the Breagagh, two salmon parr were found (Photo 7). This is at odds with the statement by Curtis *et al.*, (2009) that salmon need EPA Class A water: Q values Q4 to Q5.

5.3.4 Sea Lamprey (*Petromyzon marinus*) **(Species Code 1095)**, **Brook Lamprey** (*Lampetra planeri*) **(Species Code 1096)** and **River Lamprey** (*Lampetra fluviatilis*) **(Species Code 1099)**.

Riffle areas in the River Nore are suitable for lamprey spawning, while depositions of finer material are suitable for burrowing ammocoetes (juveniles). The presence of juvenile lampreys was confirmed in sand/silt deposits by the riverbank near the Q-value site (Photo 8).

5.3.5 Twaite Shad (*Alosa fallax*) **(Species Code 1103)**.

Twaite shad is an anadromous fish which enters large estuaries in early summer to spawn in gravels near the end of the freshwater reaches. Rooney *et al.* (2014) recorded juvenile shad in the River Nore downstream of Inistioge in summer 2013, over 30km downstream of the proposed development site. There are no records of Twaite shad occurring upstream of this point.

5.4 Invasive alien Plant Species

Two invasive alien plant species Japanese knotweed (*Fallopia japonica*) and Himalayan balsam (*Impatiens glandulifera*) were recorded on the riverbank at the subject site at ITM 65059 65633 (Photo 9), as shown in Appendix 2.

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6. CONSTRAINTS

An Invasive Alien Plant Species Management Plan will have to be prepared and implemented to avoid spreading Japanese knotweed and Himalayan balsam from the site.

Biosecurity measures to avoid spreading crayfish plague to other sites will have to be put in place.

All discharges from the site to the Nore and the Breagagh will have to have silt & hydrocarbon traps installed and maintained.

APPENDIX 1

PHOTOGRAPHS

Photo 1: River Nore adjacent to subject site

Photo 2: River Nore Q-value Sampling Site

Photo 3: Gabion mattresses on bed of Breagagh River

Photo 4: Breagagh River Q-value Sampling Site

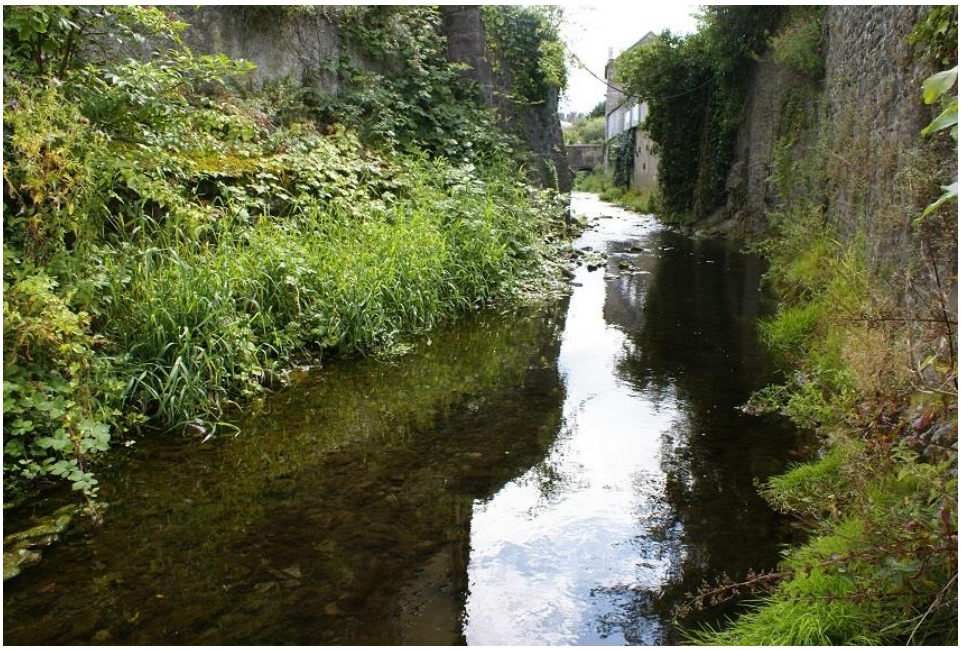


Photo 5: Vegetation in River Nore downstream of weir

Photo 6: Moribund crayfish, River Nore

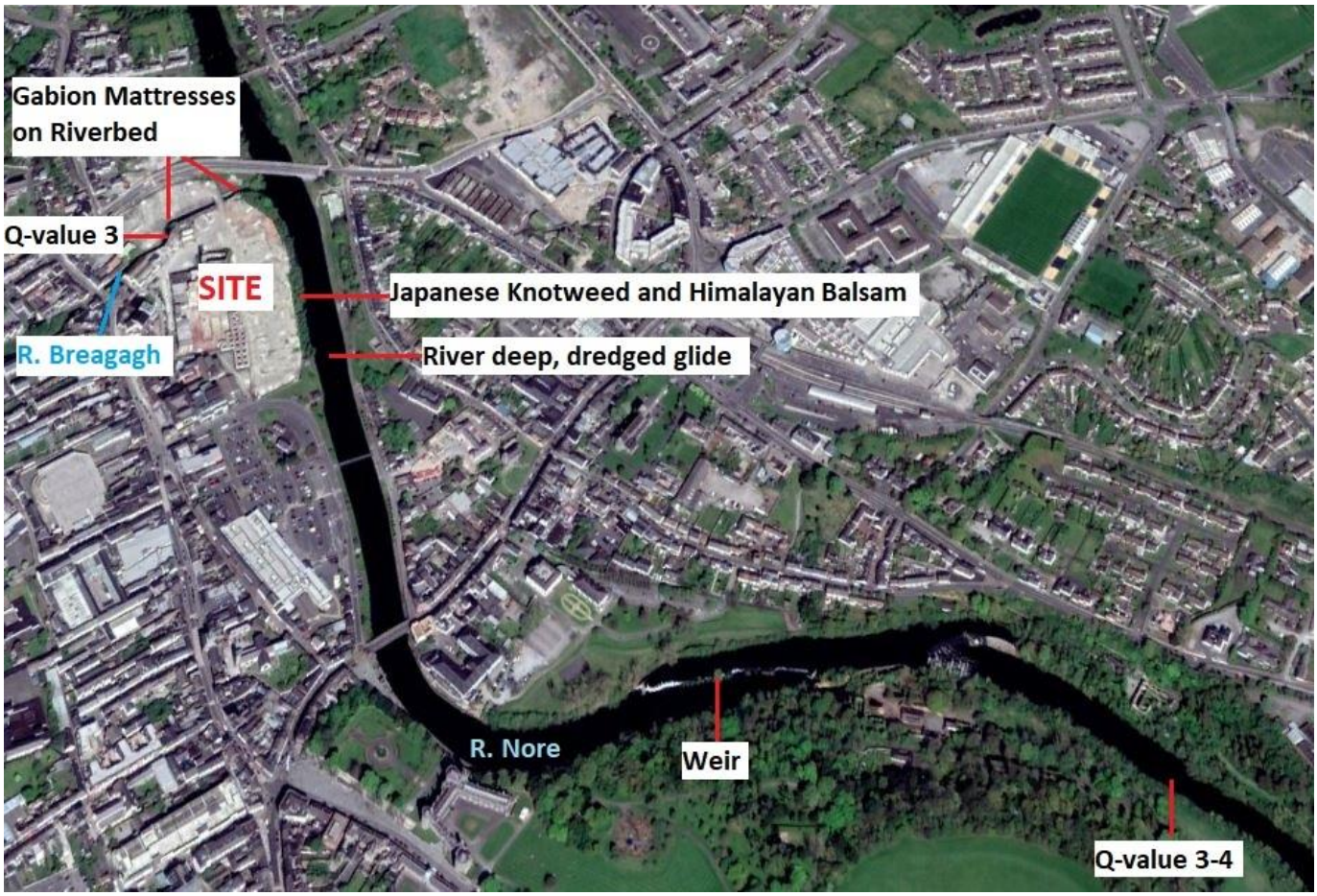
Photo 7: Salmon Parr, Breagagh River

Photo 8: Lamprey, River Nore

Photo 9: Japanese Knotweed and Himalayan Balsam on riverbank at Subject Site.

APPENDIX 2

SUBJECT SITE AND RIVERS



APPENDIX 3
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