Panther Environmental Solutions Ltd
Units 3 & 4, Innovation Centre
Institute of Technology
Green Road, Carlow
Ireland
R93 W248

Telephone: 059-9134222
Email: info@pantherwms.com
Website: www.pantherwms.com

NATURA IMPACT STATEMENT

RIVER BARROW ACTIVITY CENTRE, CARLOW TOWN PARK, CARLOW

2021

REPORT NO:	PES_NIS_21034	**AUTHOR:**	Ross Donnelly-Swift, PhD
DATE:	23rd September 2021	**REVIEWED:**	Mike Fraher, BSc.

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EXECUTIVE SUMMARY

This report has been prepared by Panther Environmental Solutions Ltd. for the proposed development of the River Barrow Activity Centre with all associated works at People's Park, Carlow, Co. Carlow.

This report identified the presence of European sites within the potential zone of influence of the proposed development and noted that the proposed development site is within/adjacent to the River Barrow and River Nore Special Area of Conservation (SAC) (Site Code: 002162). The potential for impacts to European sites as a result of the proposed development such as potential surface water quality impacts, introduction of invasive species, habitat destruction and impacts from noise and dust were considered and the level of risk posed assessed.

During Stage 1 Screening for Appropriate Assessment, it was considered that there may be potential for an indirect impact upon the qualifying interests / special conservation interests of the River Barrow and River Nore SAC due to a potential deterioration in water quality during the construction phase. Therefore, a Natura Impact Statement was prepared.

Due to the recommended control measures and standard practice during the construction phase, it is considered that there would be no significant risks to the conservation objectives of the habitats and species for which the River Barrow and River Nore SAC has been designated.

It is considered that there would be no significant risk of negative impact, either alone or in combination with other plans or projects, to the integrity of the Natura 2000 network.

1.0 INTRODUCTION

Carlow County Council is seeking approval for the construction and development of the River Barrow Activity Centre at Carlow Town Park, Co. Carlow. The proposed development will include a boat storage area, local amenities, cafe and recreational areas. The proposed site will also include additional ancillary car parking with 14 spaces located approximately 65m to the north west of the main site.

The principal aim of this study is to assess whether significant effects to European sites (the Natura 2000 network) are likely to occur as a result of this project in accordance with Article 6(3) of the Habitats Directive and the Planning and Development (Amendment) Act, 2001, as amended.

A study was undertaken by Dr. Ross Donnelly-Swift (BSc (Hons) Biology, MSc Environmental Science and PhD Biosystems Engineering) of Panther Environmental Solutions Limited. This comprised a review of the proposed development, a site visit on the 10th March 2021 to examine the ecological context of the proposed development, a desk study of the information on European sites within the potential zone of influence of the site and an analysis of the information in the context of the guidance to determine if a Natura Impact Statement is required.

This report has been prepared with regard to;

The Appropriate Assessment and Natura Impact Statement shall be undertaken in accordance with the guidance outlined in "*Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*" (DoEHLG, Dec 2009) and "*Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites*" (EC, Nov 2001) and "*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive*" (EC, 2018).

- DoEHLG (2009) "*Appropriate Assessment of Plans & Projects in Ireland*"
- Environment DG, European Commission (2002) "*Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*" Oxford Brookes University, 2001
- Department of the Environment Heritage and Local Government (DoEHLG) Circular Letter SEA 1/08 and NPWS 1/08.
- Department of the Environment Heritage and Local Government (DoEHLG) Circular letter NPWS 1/10 and PSSP 2/10

2.0 LEGISLATIVE CONTEXT

The EU Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora, as amended by council directive 97/62/EC, 2006/105/EC, and Regulation EC1882/2003 of September 2003, as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/11), provides the framework for legal protection for habitats and species of European importance. The Natura 2000 network provides an ecological infrastructure for the protection of sites that are of particular importance for rare,

endangered or vulnerable habitats and species within the EU. The Natura 2000 network in Ireland is made up of European Sites which include:

- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)

Article 6(3) of the Habitats Directive establishes the requirement for appropriate assessment when planning new developments that might affect a Natura 2000 site. Article 6(3) of the Habitats Directive states;

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

Stage 1: Screening for Appropriate Assessment
This stage involves an initial screening assessment of the potential impacts of the project, either alone or in combination with other projects, upon a Natura 2000 site. If it can be concluded that there would be no significant impacts upon Natura 2000 sites, the assessment stops at this stage. If not, or if further assessment is required, the assessment proceeds to Stage 2.

Stage 2: Appropriate Assessment / Natura Impact Statement (NIS)
This stage assesses the impact of the project, alone or in combination with other projects or plans, on the integrity of the Natura 2000 site, with respect to the site's conservation objectives, the site's ecological structure and function and its overall integrity. The output of this stage is an NIS, which also includes any mitigation measures required to avoid, reduce or offset negative impacts of the project. If this stage determines that adverse effects on the Natura 2000 site cannot be excluded, then the plan or project should proceed to Stage 3 or be abandoned.

3.0 METHODOLOGY

Stage 1 - Screening

Screening is the first stage in the Appropriate Assessment process, and is carried out to determine whether a Stage 2 Appropriate Assessment and a Natura Impact Statement (NIS) is required. Screening addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3);

1. Whether a plan or project is directly connected to or necessary for the management of the European (Natura 2000) site; and

2. Whether a plan or project, alone or in combination with other plans or projects, is likely to have significant effects on a European (Natura 2000) site, in view of its conservation objectives.

Screening should be undertaken without the inclusion of mitigation measures. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 AA and an NIS.

The findings and conclusions of the screening process should be documented, with the necessary supporting evidence and objective criteria. This is of particular importance in the cases where the Appropriate Assessment process ends at the screening stage because the conclusion is that no significant effects are likely.

Following Stage 1 Screening of this report, it was considered that there may be potential for an indirect impact upon the qualifying interests of a European site, therefore, the assessment progressed to Stage 2.

Stage 2 – Natura Impact Assessment

The scope of this assessment follows the appropriate assessment statement methodology as defined within the European Commission guidance document "*Assessment of plans and projects significantly affecting Natura 2000 sites"* (2002), Section 3, Part 2. Guidance from the Department of the Environment, Heritage and Local Government "*Appropriate Assessment of Plans and Projects in Ireland*" (2009) and "*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive*" (2018) have also been used in the preparation of this report. In accordance with this guidance, the following methodology has been used to produce this Natura Impact Statement:

Step 1**:** Information Required
Identifying the conservation objectives of the Natura 2000 site and the aspects of the project, alone or in combination with other projects or plans, which have the potential to affect those conservation objectives.

This process involves gathering information for the Natura 2000 site, including the conservation objectives of the site, factors contributing to conservation value, aspects sensitive to change and the existing baseline condition of the site. The principal source of information used for Natura 2000 sites, their qualifying interests and conservation objectives is the National Parks and Wildlife Service (NPWS). Information is also required for the project including the size and scale of the project, the relationship (distance, connectivity etc.) of the project to the Natura 2000 site and the characteristics of existing, proposed or other projects which have the potential to affect the Natura 2000 site.

Step 2: Impact Prediction
This process predicts and identifies the likely impacts of the project on the Natura 2000 site. Potential impacts are identified as; direct and indirect; short or long-term duration; construction, operational or decommissioning; and isolated, interactive and cumulative effects.

Step 3: Conservation Objectives
Once the potential impacts of the project have been predicted and identified, it will be necessary to assess whether these impacts will adversely impact upon the integrity of the Natura 2000 site, as defined by the site's conservation objectives and status of the site. Where it cannot be demonstrated that there will be no adverse impacts upon the Natura 2000 site, mitigation measures must be proposed for the project.

Step 4: Mitigation Measures
Upon the identification of potential impacts, the project will have on the Natura 2000 site (alone or in combination with other projects or plans), mitigation measures will be proposed to eliminate, reduce or offset these negative impacts. Mitigation measures should be considered with preference to the hierarchy of preferred options outlined in the guidance document "*Assessment of plans and projects significantly affecting Natura 2000 sites"*.

3.1 METHODOLOGY BACKGROUND

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

- *Appropriate Assessment of Plans and Projects in Ireland. Guidelines for Planning Authorities*. DoEHLG, 2009.
- Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities
- *Managing Natura 2000 sites – The Provisions of Article 6 of The Habitats Directive 92/43/EEC.* European Commission, 2000.
- Circular L8/08 Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments 2 September 2008
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites. Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, 2002.
- Commission Notice "Managing Natura 200 sites The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, 21.11.2018
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

3.2 DESKTOP RESEARCH

- Desktop research was carried out to gather information on the ecology of the site and surrounding areas. The locations of the Natura 2000 sites within 15km of Peoples Park, Carlow Town, were identified from National Parks and Wildlife Service (NPWS) online map viewer. Other Natura sites beyond 15km were also reviewed and considered for the potential for the project to have a negative effect.

- Water quality data from the EPA was reviewed for the assessment of biological and environmental data collected on waterbodies in Ireland (Water Quality in Ireland 2013-2018 (2019))

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

3.3 SITE SURVEY

A site characterisation assessment was undertaken on the 10th March 2021 to examine the ecological context of the development site, by systematically walking the site, adjacent land and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.*, 2011).

Bird species and signs of fauna activity and dwellings were also noted. Particular attention was given to the possible presence of habitats and/or species, which are legally protected under Irish and European legislation and to assessing any potential ecological connectivity with Natura 2000 sites or supplementary or stepping stone habitats of relevance to Natura 200 sites.

4.0 DESCRIPTION OF PROPOSED DEVELOPMENT & EXISTING SITE

4.1 DESCRIPTION OF PROPOSED DEVELOPMENT

The proposed development would comprise of the construction of a River Barrow Activity Centre at Carlow Town Park as shown in Figure 4.1 below. The development will include the construction of boat storage areas measuring 310m^2 that can accommodate approximately 50 boats such as rowing boats, dragon boats, kayaks and canoes. In addition, the proposed development will include a kitchen, canteen, outdoor terraced seating, function rooms, gym, showers and changing rooms over two floors. The total floor area of the development is 805m^2. Additional ancillary car parking with 14 spaces will be located approximately 65m to the north west of the main building with a total area of approximately 0.096Ha (Site B). The main access to the site is via Barrow Street which connects to Maryborough Street and then Bridge Street to the south. The River Barrow and River Nore Special Area of Conservation (SAC) site (Site Code: 002162), is located partly within the north eastern boundary and adjacent the south eastern boundary of the proposed site, as shown in Figure 4.2.

Waste water will connect with the municipal sewer. Stormwater, comprised of rainwater run-off from the roofs and hard surfaces will be directed to a new onsite drainage system with a hydrocarbon interceptor before connecting to the existing drainage network within Carlow Town Park. Water from boat washing facilities will pass through a silt chamber with a gravity flow with a UV light for biological control before connecting to the surface water drainage system at Carlow Town Park. This will be installed by Molloy Environmental Systems. No chemicals will be used at the boat washing facility. The proposed finish for the carpark at site B is a porous asphalt. The access road surface water runoff will connect to the existing drainage network within the vicinity of the carpark. The proposed heating system will be air to water heat pump.

Figure 4.1: Location of Proposed Development at Carlow Town

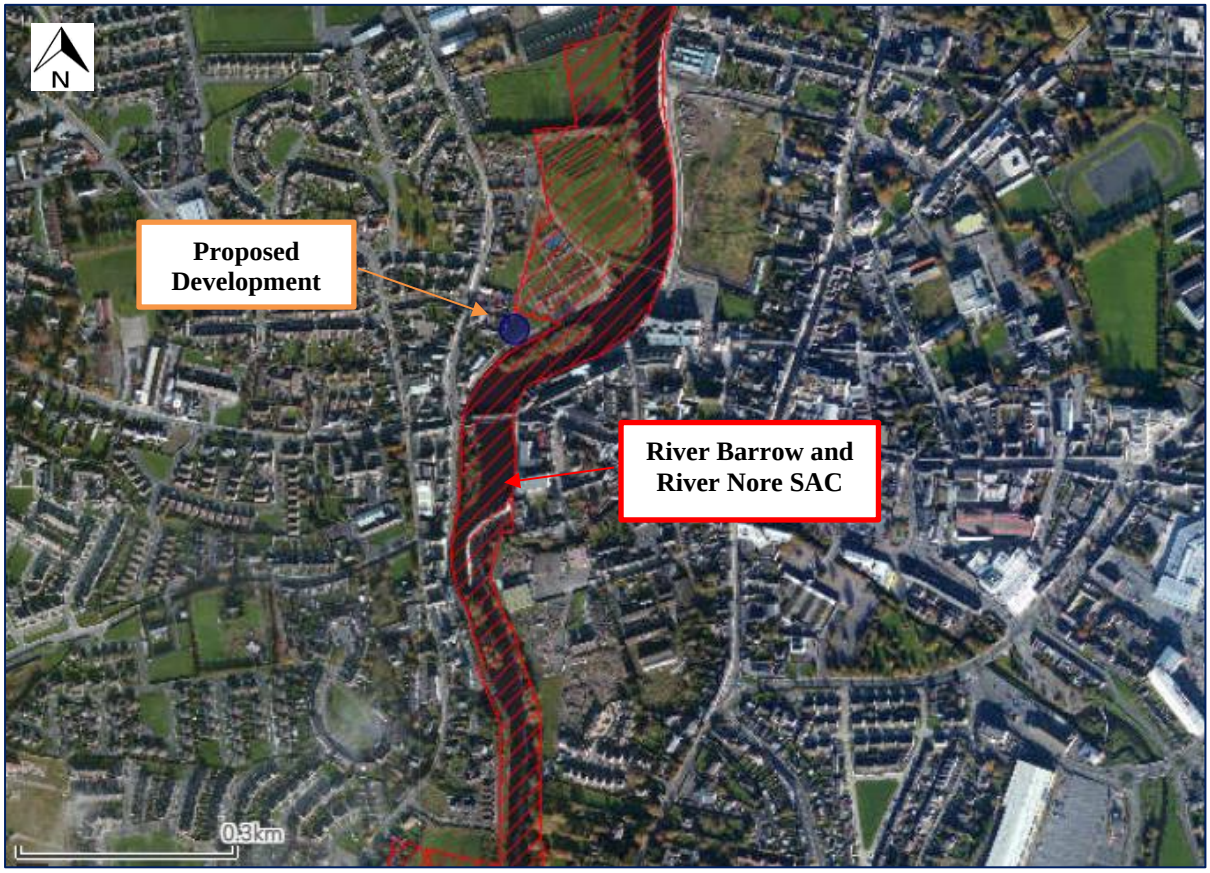

Figure 4.2: Proposed Development Relative to the River Barrow and River Nore SAC

During the construction phase, site clearance works would be undertaken, this would involve the removal of trees and amenity grassland within the site boundary. A landscape plan has been prepared by Studio Town Land that will include native and non-invasive ornamental species. No works will take place within a riparian habitat of the River Barrow. The existing OPW flood defence wall will be altered to allow for pedestrian steps to access Bachelors Walk while maintaining the flood defence height. During excavation works, excavated soil would be temporarily stored onsite before been removed to a licenced facility if a re-use in reinstatement works where not possible. Approximately 2037m^3 of material will be removed from the site. This material will be inspected by the construction contractor to determine if can be reused at the site during construction works or removed to a licenced waste facility. See IGSL Ltd site assessment for soil test results (Document Ref: IGSL_23016). The total amount of hardcore material to be used in construction of the proposed development will be 1500-2000m^3. Following site clearance works, construction of the water activity and community centre and all associated works would commence. The expected construction timeframe would be approximately eighteen months.

The proposed operational phase of the proposed development will be to provide a base for current facilities already taking place within Carlow Town such as the park run, cycling, rowing, canoeing, kayaking, dragon boats and similar water-based activities already in place on the River Barrow at Carlow Town. The main building will be in operational use after dark in the winter months for training facilities, community meetings and recreational use. Activities on the River Barrow will be initially confined to the existing water-based sports and recreational use already in place by the clubs within Carlow Town such as Carlow Rowing Club, Carlow Triathlon Club, Cliff Reid Boat Trips, Carlow Scout Group and Graham Wall Kayaking. The proposed development will act as a base to existing events on the River Barrow such as Carlow Rowing Regatta, The Dragon Run, Carlow Triathlon and Barrow Dragon Boat Regatta. No water-based activities will take place during the night. Lighting of the proposed development will minimise direct lighting of the River Barrow to limit light disturbance of the waterbody at night.

4.2 EXISTING ENVIRONMENT

The existing site is located within Carlow Town Park approximately 400m from Carlow Town centre, on the west bank of the River Barrow. The site is surrounded by a mixture of commercial properties, residential properties and amenity gardens. The River Barrow flows south along the south-eastern boundary of the site.

A site investigation of ground conditions was carried out by IGSL Ltd. Report issued in February 2021 (Document Ref: 23016). Boreholes were constructed in three locations to determine bedrock depth. The bedrock was found at a depth of 15m and is blue-grey fine-grained limestone in a strong to very strong condition. Water was found at depths of 2m and 4.5m. Trial pits were excavated in five locations for soil tests. The soils are predominately clay of low and intermediate plasticity. An infiltration test was carried out and noted the soil is not suitable for soakaways. Proposed stormwater drainage should connect to an existing surface water system, using attenuation techniques to regulate the flow. See site investigation report for geotechnical records.

A Flood Risk Assessment (FRA) issued on the 22nd September 2021 by DRA Consulting Engineers (Document Ref: K194). This report notes the proposed development site is located in an area susceptible to flooding however the proposed structures are set at a level which provides protection from flooding up to the 0.1% AEP. The site is within a flood risk zone however the site benefits from a certified OPW flood defence scheme. For a flood event to occur at Site A (activity centre) then the OPW flood defences would need to be breached. For a flood event at Site B (carpark) an overbank breach of the River Barrow would need to occur. Any flood waters at Site B (carpark) would discharge to ground through the permeable surface or will be captured within the stormwater drainage system. The report recommends all wastewater and surface water drains / sewers servicing the proposed development should be fitted with non-return valves to mitigate flood waters from rising up drains during extreme flood events. The pluvial flood risk to the proposed development at Site A (activity centre) and Site B (carpark) is considered to be low and no further mitigation measures are proposed.

During the site walkover, nine habitats were identified within and adjacent the site boundary. The first main habitat at the site is buildings and artificial surfaces (BL3). This habitat has limited flora with Ivy (*Hedera helix*), Groundsel (*Senecio vulgaris*), Ivy-leaved Toadflax (*Cymbalaria muralis*), Hairy Bittercress (*Cardamine hirsute*), Ragwort (*Senecio jacobaea*), Valerian (*Centranthus ruber*) and Moss (*Grimmia* spp.).

Within the site boundary is scattered trees and parkland (WD5) with Lime (*Tilia* spp.) the dominant species. This habitat is also found outside the site boundary with Birch (*Betula* spp.) Aspen (*Populus tremula 'Erecta'*) and Horse-chestnut (*Aesculus hippocastanum*).

Another main habitat of the site is improved amenity grassland (GA2) habitat. Grass species are dominant such as Fescue (*Festuca* spp.), Ryegrasses (*Lolium* spp.) and Annual Meadow-grass (*Poa annua*). Other flora includes Dandelion (*Taraxacum* spp.), Daisy (*Bellis perennis*), Clover (*Trifolium* spp.), Sticky Mouse-ear (*Cerastium glomeratum*) and Yarrow (*Achillea millefolium*).

Within Carlow Town Park is ornamental/non-native shrubs (WS3) habitat. Flora include Cotoneaster, Darwin's barberry (*Berberis darwinii*), Laurustinus (*Viburnum tinus*), Flowering quince (*Chaenomeles speciosa*), Bamboo (*Bambusoideae*), St. John's Wort (*Hypericum calycinum*), Portuguese laurel (*Prunus lusitanica*) and Californian rose (*Rosa nutkana).*

Along the west boundary is hedgerow (WL1) habitat with Ash (*Fraxinus excelsior*), Elder (*Sambucus nigra*), Holly (*Ilex aquifolium*), Ivy (*Hedera helix*), Virginia Creeper (*Parthenocissus Quinquefolia*), Bramble (*Rubus fruticosus*), Cleavers (*Galium aparine*) and Nettle (*Urtica dioica*).

Within the proposed boundary of the proposed carpark to the north west of the main site is (GA2) habitat, recolonising bare ground (ED3) and scrub (WS1) habitats. Flora found here include Nettle (*Urtica dioica*), Sycamore (*Acer pseudoplatanus*), Bramble (*Rubus fruticosus*), Willow (*Salix* spp.), Dock (*Rumex* spp.), Thistle (*Cirsium* spp.), Butterfly-bush (*Buddleja davidii*), Cock's-foot (*Dactylis glomerata*), Couch-grass (*Elytrigia repens*), Willowherb (*Epilobium* spp.), Vetch (*Vicia* spp.) and Herb-Robert (*Geranium robertianum*).

The River Barrow is classified as depositing /lowland rivers (FW2) habitat. With an area of riparian woodland (WN5) located on a small island within the River Barrow to the south east of the proposed site. Flora include Willow (*Salix* spp.) Hogweed (*Heracleum* spp.), Bramble

(*Rubus fruticosus*), Ivy (*Hedera helix*), Dock (*Rumex* spp.), Willowherb (*Epilobium* spp.), Sedges (*Carex* spp.) and Reeds (*Phragmite*s spp).

The majority of the development sites, comprising of buildings and artificial surfaces, ornamental/non-native shrubs, scrub, recolonising bare ground and improved amenity grassland can be considered as modified and of low biodiversity value. No plant species of conservation significance or invasive plant species of concern were noted during the site assessment.

The identified habitats at the proposed development site (and adjacent), as per the Fossitt habitat classification scheme, are summarised in Table 4.1 below.

Table 4.1: Summary of Habitats Identified at and Adjacent the Proposed Development Site

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	**LEVEL 2**	**LEVEL 3**
B – Cultivated and built land	**BL –** Built land	**BL3 -** Buildings and artificial surfaces
E – Exposed rock and disturbed ground	**ED –** Disturbed ground	**ED3 –** Recolonising bare ground
F – Freshwater	**FW –** Watercourses	**FW2 –** Depositing/lowland rivers
G – Grassland and marsh	**GA –** Improved grassland	**GA2 –** Amenity grassland (improved)
W – Woodland and scrub	**WN -** Semi natural woodland	**WN5 -** Riparian woodland
	WD – Highly modified/non-native woodland	**WD5 –** Scattered trees and parkland
	WS – Scrub/transitional woodland	**WS1 –** Scrub
		WS3 – Ornamental/non-native shrubs
	WL – Linear woodland / scrub	**WL1** - Hedgerows

Given the urban land use of the surrounding area, it would be expected that common garden and hedgerow bird species in addition to waterfowl would be present in the area. Bird species noted during the site walkover included, Cormorant (*Phalacrocorax carbo*), Grey Heron (*Ardea cinerea*), Mallard (*Anas platyrhynchos*), Mute Swan (*Cyngus olor*), Grey Wagtail (*Motacilla cinera*), Goldfinch (*Carduelis carduelis*), Blackbird (*Turdus merula*), Chaffinch (*Fringilla coelebs*), Magpie (*Pica pica*), Great Tit (*Parus major*), Dunnock (*Prunella modularis*), Starling (*Sturnus vulgaris*), Feral pigeons (*Columba livia domestica*), House Sparrow (*Passer domesticus*), Rook (*Corvus frugilegus*), Song Thrush (*Turdus philomelos*), Jackdaw (*Corvus monedula*), and Woodpigeon (*Columba palumbus*). No species are red listed under the BoCCI classification, however, four species, Cormorant, Mute Swan, Starling, House Sparrow are amber listed. None of the bird species recorded are listed under Annex I of the E.U. Birds Directive.

No other fauna, or evidence of other fauna, were noted during the survey. There was no evidence of Badger (including setts or latrines), or Otter (including spraints, holts or slides) at the proposed development site.

Mammals, typical of that found throughout the rest of Ireland, which would be expected to be found in the general area include Bat species, Badger (*Meles meles*), Fox (*Vulpes vulpes*), Otter (*Lutra lutra*), Pine Marten (*Martes martes*), Stoat (*Mustela erminea hibernica*), American Mink (*Mustela vison*), Irish Hare (*Lepus timidus hibernicus*), Rabbit (*Oryctolagus cuniculus*), Hedgehog (*Erinus europaeus*), Red Squirrel (*Sciurus vulgaris*), Grey Squirrel (*Sciurus carolinensis*), Wood Mouse (*Apodemus sylvaticus*), Brown Rat (*Rattus norvegicus*) and Deer.

In addition to the site walkover, flora and fauna records were reviewed on the National Biodiversity Data Centre (NBDC) website for the proposed development site and vicinity. No protected plant species under the Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) were recorded within the 10km square (Tetrad - S77) in which the proposed development site is located, while seven invasive flora species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 have been recorded by the NBDC within the 10km square (Tetrad - S77) in which the proposed development site is located; Canadian Waterweed (*Elodea canadensis*), Indian Balsam (*Impatiens glandulifera*), Giant Hogweed *(Heracleum mantegazzianum*), Japanese Knotweed (*Fallopia japonica*), Nuttall's Waterweed (*Elodea nuttallii*) and Water Fern (*Azolla filiculoides*). However, no invasive species of concern were noted as present within the site boundary during the site walkover.

Fauna records for the previous thirty years were reviewed on the NBDC website for the 10km square (Tetrad - S77) in which the proposed development is located. Bird species of note recorded within the 10km square include Barn Owl (*Tyto alba*), Black-headed Gull (*Larus ridibundus*), Canada Goose *(Branta canadensis*), Coot (*Fulica atra*), Grasshopper Warbler (*Locustella naevia*), Kingfisher (*Alcedo atthis*), Linnet (*Carduelis cannabina*), Kestrel (*Falco tinnunculus*), Pheasant (*Phasianus colchicus*), Pochard (*Aythya ferina*), Sandpiper (*Actitis hypoleucos*), Snipe (*Gallinago gallinago*), Sand Martin (*Riparia riparia*), Starling (*Sturnus vulgaris*), Teal (*Anas crecca*), Tree Sparrow (*Passer montanus*), Swift *(Apus apus*), Corn Crake (*Crex crex*), Golden Plover (*Pluvialis apricaria*), Woodcock *(Scolopax rusticola*), Great Cormorant (*Phalacrocorax carbo*), Great Black-backed Gull (*Larus marinus*), Gadwall (*Anas strepera*), House Martin (*Delichon urbicum*), Spotted Flycatcher (*Muscicapa striata*), Sky Lark (*Alauda arvensis*), Lesser Black-backed Gull (*Larus fuscus*), Little Egret (*Egretta garzetta*), House Sparrow (*Passer domesticus*), Little Grebe (*Tachybaptus ruficollis*), Northern Lapwing (*Vanellus vanellus*), Water Rail (*Rallus aquaticus*), Mute Swan (*Cygnus olor*), Tufted Duck (*Aythya fuligula*) Whooper Swan *(Cygnus cygnus*), Mallard (*Anas platyrhynchos*), Rock Pigeon (*Columba livia*), Stock Pigeon (*Columba oenas*), Yellowhammer (*Emberiza citrinella*) and Woodpigeon (*Columba palumbus*).

Protected Fauna of note include the protected species Common Frog (*Rana temporaria*), Smooth Newt (*Lissotriton vulgaris*), Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Otter (*Lutra lutra*), Pine Marten (*Martes martes*), Red Deer (*Cervus elaphus*) Hedgehog (*Erinaceus europaeus*), Brown Long-eared Bat (*Plecotus auritus*), Daubenton's Bat (*Myotis daubentonii*), Lesser Noctule (*Nyctalus leisleri*), Natterer's Bat (*Myotis nattereri*), Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*).

Invertebrates of note include Freshwater White-clawed Crayfish (*Austropotamobius pallipes*), Small Heath (*Coenonympha pamphilus*), Bombus (*Bombus cryptarum*), Large Red-Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius*), Small Heath (*Coenonympha pamphilus*) and Moss Carder-bee (*Bombus (Thoracombus) muscorum*).

Invasive fauna of note include Freshwater shrimp (*Gammarus pulex*), American Mink (*Mustela vison*), Brown Rat (*Rattus norvegicus*), Grey Squirrel (*Sciurus carolinensis*), Rabbit (*Oryctolagus cuniculus*), White-toothed Shrew (*Crocidura russula*), House Mouse (*Mus musculus*) and Sika Deer (*Cervus nippon*).

4.2.1 Additional Information on Water Quality

The proposed development is located within the Barrow Catchment (Barrow SC 150). The site is located in the immediate vicinity of the River Barrow and River Nore Special Area of Conservation (SAC) (Site Code: 002162). The site itself sits on the western bank of the River Barrow. The Conservation Objectives document for the SAC shows that water quality objectives have been set for White-clawed Crayfish (*Austropotamobius pallipes*) and Atlantic Salmon (*Salmo salar*), with a Q3-4 (moderate status) and Q4 (good status) values set as objectives in freshwater. Water quality objectives have also been set for Twaite Shad, with a target of oxygen levels no lower than 5mg/l.

The Environmental Protection Agency (EPA) undertake surface water monitoring along the River Barrow. The results for the nearest monitoring stations (as per Table 4.2) with available monitoring results for the period 2000 – 2018 are summarised in Figure 4.3 below for indicative purposes.

Table 4.2: Active Monitoring Stations of the Barrow River

STATION NO.	STATION LOCATION	EASTING	NORTHING	APPROX. LOCATION RELATIVE TO PROPOSED SITE
RS14B012200	New Br 1km u/s Carlow Br	272007	177778	1km Upstream
RS14B012450	Footbridge, Dolmen Hotel	270653	174173	2.9km Downstream
RS14B012600	Milford Br	269975	170430	6.65km Downstream

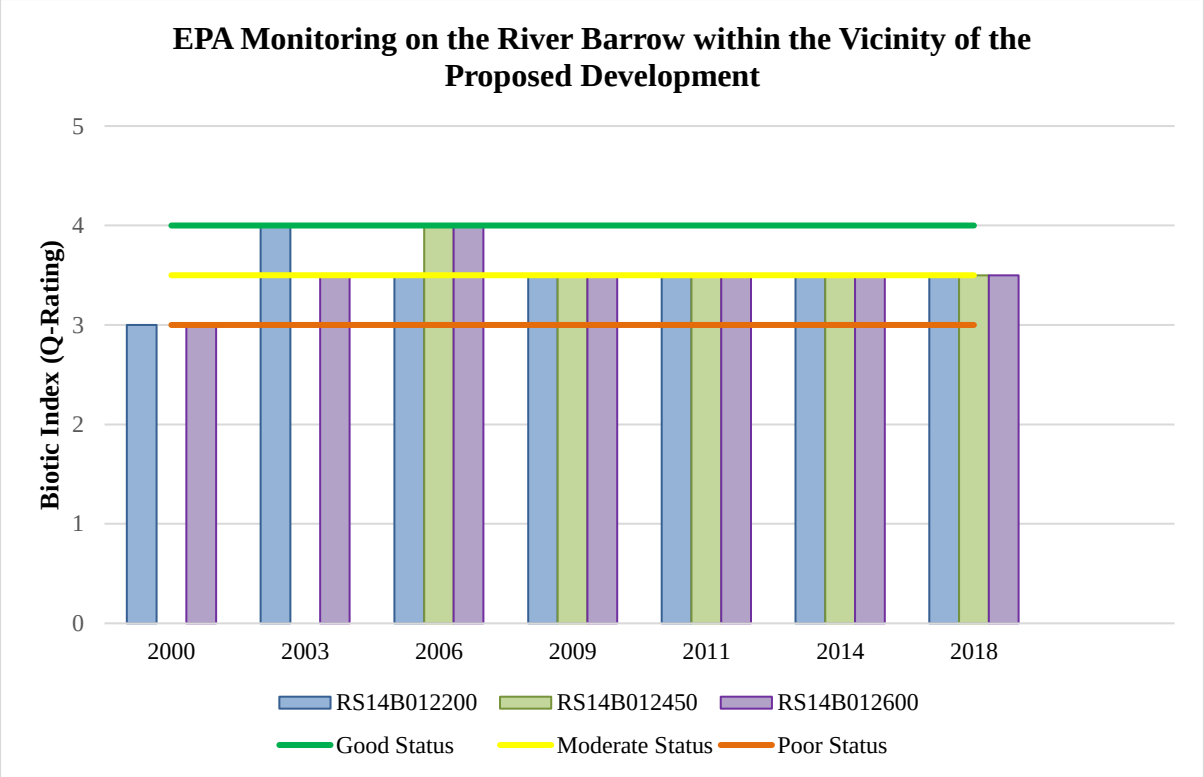

Figure 4.3: EPA Ecological Monitoring of the Barrow River from 2000 – 2018

As can be seen in Figure 4.3 above, the Barrow River is mainly achieving a water quality status of between Q4 (good) and Q3-4 (moderate) at the monitoring locations (Table 4.2), with the status of all stations declining to Q3-4 (moderate) from 2009. EPA comments on the most recent monitoring results for the Barrow River are as follows; *"The Barrow was sampled across 2017 and 2018 due to the outbreak of crayfish plague, with several additional surveys in 2019. Of the 12 stations sampled along the Barrow in 2017, stations 0200, 0780, 1300, 1500, 2900 were in Good ecological condition, while the two uppermost stations maintained High ecological quality (0050 & 0100). A decline to unsatisfactory Moderate quality occurred at Station 1000 (Pass Bridge) and the lowermost station at Graiguenamanagh (3500). In 2018, station 0300 (Twomile Br) improved to High ecological quality, while station 1900 (Tankardstown Br) declined to unsatisfactory Poor quality. The latter site had an overabundance of Potamopyrgus snails and too much instream algae. Station 0700 (Kilnahown Br) retained Good ecological quality and stations 0500, 2200, 2455, 2600 and 2680 all remained at unsatisfactory Moderate ecological quality. In July 2019, despite increases in the diversity of sensitive taxa, pollution tolerant groups still dominated and filamentous algae was excessive at Ford S. of Trascan (0900) which remained moderate. Ballyteigelea Bridge (3300) also remained Moderate, while Tankerstown (1900) improved slightly to Moderate ecological status."*

5.0 EUROPEAN SITES (NATURA 2000 SITES)

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

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

There is no standard radius that can be used to select which European sites are to be analysed. This can only be determined by looking at the zone of influence of the project at hand. A rule of thumb often used is to include all European sites within a distance of 15km. No Special Protection Area (SPA) sites occur within 15km of the proposed development. Two Special Area of Conservation (SAC) sites occur within 15km of the proposed development and are shown in the following table:

Table 5.1: Summary of Protected European Sites

SITE NAME	DESIGNATION	SITE CODE	APPROX. DISTANCE FROM PROPOSED SITE
River Barrow and River Nore	SAC	002162	Within/adjacent
Slaney River Valley	SAC	000781	10.70km East

Maps detailing European sites within 2km and 15km of the proposed site are included as Appendix A below.

For this assessment, the site considered to be within the potential zone of influence of the proposed development was the River Barrow and River Nore SAC (Site Code: 002162), due to the site being located within/adjacent of the above SAC.

The proposed development is not hydrologically connected to the Slaney River Valley SAC. Therefore, in the absence of a source-pathway-receptor relationship and given the distance from the proposed development, this SAC site has been screened out.

5.1 RIVER BARROW AND RIVER NORE SAC (SITE CODE: 002162)

This SAC is composed of the freshwater stretches of the Barrow and Nore catchments, as far upstream as the Slieve Bloom Mountains, and the tidal elements and estuary as far downstream as Creadun Head in Waterford. The larger tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. The site is a SAC selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive:

Table 5.2: Annex I Habitats of River Barrow and River Nore SAC

ANNEX I HABITATS	
CODE	DESCRIPTION
1130	Estuaries
1140	Tidal Mudflats and Sandflats
1170	Reefs

ANNEX I HABITATS	
CODE	**DESCRIPTION**
1310	*Salicornia* Mud
1330	Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)
1410	Mediterranean Salt Meadows (*Juncetalia maritimi*)
3260	Floating River Vegetation
4030	Dry Heath
6430	Hydrophilous Tall Herb Communities
7220	Petrifying Springs*
91A0	Old Oak Woodlands
91E0	Alluvial Forests*

** denotes a priority habitat*

Table 5.3: Annex II Species of River Barrow and River Nore SAC

ANNEX II SPECIES		
CODE	**COMMON NAME**	**SCIENTIFIC NAME**
1016	Desmoulin's Whorl Snail	*Vertigo moulinsiana*
1029	Freshwater Pearl Mussel	*Margaritifera margaritifera*
1092	White-clawed Crayfish	*Austropotamobius pallipes*
1095	Sea Lamprey	*Petromyzon marinus*
1096	Brook Lamprey	*Lampetra planeri*
1099	River Lamprey	*Lampetra fluviatilis*
1103	Twaite Shad	*Alosa fallax*
1106	Atlantic Salmon	*Salmo salar*
1355	Otter	*Lutra lutra*
1421	Killarney Fern	*Trichomanes speciosum*
1990	Nore Freshwater Pearl Mussel	*Margaritifera durrovensis*

The conservation objectives for the SAC site are to maintain or restore the favourable conservation condition of the qualifying interests. An excerpt from the Natura 2000 Data Form for the River Barrow and River Nore SAC is included below, while further details are available within the site's site synopsis (NPWS, 2016).

"This site consists of most of the freshwater stretches of the Barrow/Nore River catchments. The Barrow is tidal as far upriver as Graiguenamanagh while the Nore is tidal as far upriver as Inishtioge. The site also includes the extreme lower reaches of the River Suir and all of the estuarine component of Waterford Harbour extending to Creadan Head. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains. They traverse limestone bedrock for a good proportion of their routes, though the middle reaches of the Barrow and many of the eastern tributaries run through Leinster Granite. A wide range of habitats associated with the rivers are included within the site, including substantial areas of woodland (deciduous, mixed), dry heath, wet grassland, swamp and marsh vegetation, salt marshes, a small dune system, biogenic reefs and intertidal sand and mud flats. Areas of improved grassland, arable land and coniferous plantations are included in the site for water quality reasons.

The site supports many Annexed habitats including the priority habitats of alluvial woodland and petrifying springs. Quality of habitat is generally good. The site also supports a number of Annex II animal species – Atlantic Salmon (*Salmo salar*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*), Twaite Shad (*Alosa fallax*), White-clawed Crayfish (*Austropotamobius pallipes*), Sea Lamprey (*Petromyzon marinus*), Otter (*Lutra lutra*), River Lamprey (*Lampetra fluviatilis*) and Brook Lamprey (*Lampetra planeri*). Annex I Bird species include Greenland White-fronted Goose (*Anser albifrons flavirostris*), Peregrine Falcon (*Falco peregrinus*), Whooper Swan (*Cygnus cygnus*), Bewick's Swan (*Cygnus columbianus bewickii*), Bar-tailed Godwit (*Limosa lapponica*), Golden Plover (*Pluvialis apricaria*) and Kingfisher (*Alcedo atthis*). A range of rare plants and invertebrates are found in the woods along these rivers and rare plants are also associated with the saltmarsh."

The main site vulnerabilities, including any key pressures or trends within and around the River Barrow and River Nore SAC that have been identified as impacting upon the site, may be summarised as agricultural intensification, pollution to surface waters, human induced changes in hydraulic conditions and erosion.

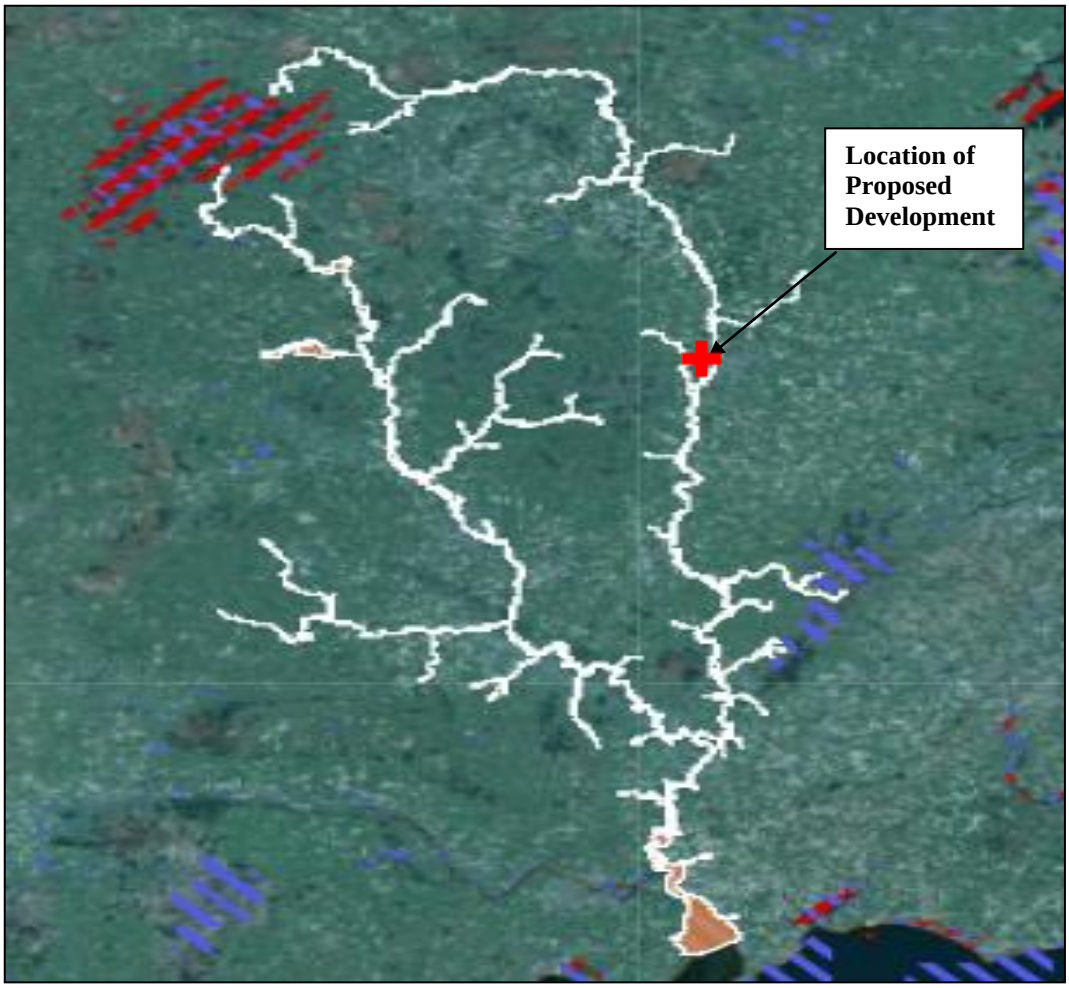

Figure 5.1: River Barrow and River Nore SAC

River Barrow and River Nore SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the River Barrow and River Nore SAC are provided in the Table 5.4 below, where available from the NPWS document "*Conservation Objectives: River Barrow and River Nore SAC 002162*" (NPWS, 2011).

ATTRIBUTE	MEASURE	TARGET
[1130] Estuaries		
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex; Fine sand with *Fabulina fabula* community.
Community extent	Hectares	Maintain the natural extent of the *Sabellaria alveolata* reef, subject to natural process
[1140] Tidal Mudflats and Sandflats		
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex
[1170] Reefs		
None Specified	-	-
[1310] Salicornia Mud		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution	Occurrence	No decline, subject to natural processes
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of Spartina. No new sites for this species and an annual spread of less than 1% where it is already known to occur

ATTRIBUTE	MEASURE	TARGET
[1330] Atlantic Salt Meadows		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession
Habitat distribution	Occurrence	No decline, subject to natural processes
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur
[1410] Mediterranean Salt Meadows		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 0.08ha, Rochestown - 0.04ha, Ringville - 6.70ha
Habitat distribution	Occurrence	No decline, subject to natural processes
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	% cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.

ATTRIBUTE	MEASURE	TARGET
Vegetation composition: typical species and sub-communities	% cover at a representative sample of monitoring stops	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur
[3260] Floating River Vegetation		
Habitat distribution	Occurrence	No decline, subject to natural processes
Habitat area	Kilometres	Area stable or increasing, subject to natural processes
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes
Hydrological regime: groundwater discharge	Metres per second	The groundwater flow to the habitat should be permanent and sufficient to maintain tufa formation
Substratum composition: particle size range	Millimetres	The substratum should be dominated by large particles and free from fine sediments
Water chemistry: minerals	Milligrammes per litre	The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits
Water quality: suspended sediment	Milligrammes per litre	The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition
Floodplain connectivity	Area	The area of active floodplain at and upstream of the habitat should be maintained
[4030] Dry Heath		
Habitat distribution	Occurrence	No decline from current habitat distribution, subject to natural processes
Habitat area	Hectares	Area stable or increasing, subject to natural processes. Habitat area is not known but estimated as less than 400ha of the area of the SAC, occurring in dispersed locations
Physical structure: free-draining, acid, low nutrient soil; rock outcrops	Occurrence	No significant change in soil nutrient status, subject to natural processes. No increase or decrease in area of natural rock outcrop
Vegetation structure: sub- shrub indicator species	Percentage cover	Cover of characteristic sub- shrub indicator species at least 25%: gorse (*Ulex europaeus*) and where rocky outcrops occur bilberry (*Vaccinium myrtillus*) and woodrush (*Luzula sylvatica*). Some rock outcrops support English stonecrop (*Sedum anglicum*), sheep's bit (*Jasione montana*) and wild madder (*Rubia peregrina*) as well as important moss and lichen assemblages
Vegetation structure: senescent gorse	Percentage cover	Cover of senescent gorse less than 50%
Vegetation structure: browsing	Percentage cover	Long shoots of bilberry with signs of browsing collectively less than 33%

ATTRIBUTE	MEASURE	TARGET
Vegetation structure: native trees and shrubs	Percentage cover	Cover of scattered native trees and shrub less than 20%
Vegetation composition: positive indicator species	Number	Number of positive indicator species at least 2 e.g. gorse and associated dry heath/ acid grassland flora
Vegetation structure: positive indicator species	Percentage cover	Cover of positive indicator species at least 60%. This should include plant species characteristic of dry heath in this SAC including gorse, bilberry and associated acid grassland flora
Vegetation composition: bryophyte and non-crustose lichen species	Number	Number of bryophyte or non- crustose lichen species present at least 2
Vegetation composition: bracken (*Pteridium aquilinum*)	Percentage cover	Cover of bracken less than 10%
Vegetation structure: weedy negative indicator species	Percentage cover	Cover of agricultural weed species (negative indicator species) less than 1%
Vegetation composition: non-native species	Percentage cover	Cover of non-native species less than 1%.
Vegetation composition: rare/scarce heath species	Location, area and number	No decline in distribution or population sizes of rare, threatened or scarce species, including Greater Broomrape (*Orobanche rapum-genistae*) and the legally protected clustered clover (*Trifolium glomeratum*)
Vegetation structure: disturbed bare ground	Percentage cover	Cover of disturbed bare ground less than 10% (but if peat soil less than 5%)
Vegetation structure: burning	Occurrence	No signs of burning within sensitive areas
[6430] Hydrophilous Tall Herb Communities		
Habitat distribution	Occurrence	No decline, subject to natural processes
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Hydrological regime: Flooding depth/height of water table	Metres	Maintain appropriate hydrological regimes
Vegetation structure: sward height	Centimetres	30-70% of sward is between 40 and 150cm in height
Vegetation composition: broadleaf herb: grass ratio	Percentage	Broadleaf herb component of vegetation between 40 and 90%
Vegetation composition: typical species	Number	At least 5 positive indicator species present
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (*Impatiens glandulifera*), monkeyflower (*Mimulus guttatus*), Japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzianum*)
[7220] Petrifying Springs		
Habitat area	Square metres	Area stable or increasing, subject to natural processes

ATTRIBUTE	MEASURE	TARGET
Habitat distribution	Occurrence	No decline
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes
Water quality	Water chemistry measures	Maintain oligotrophic and calcareous conditions
Vegetation composition: typical species	Occurrence	Maintain typical species
[91A0] Old Oak Woodlands		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 85.08ha for sub-sites surveyed
Habitat distribution	Occurrence	No decline.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least $30m^3$/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[91E0] Alluvial Forests		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 181.54ha for sites surveyed
Habitat distribution	Occurrence	No decline.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer

ATTRIBUTE	MEASURE	TARGET
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least $30m^3$/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including ash (*Fraxinus excelsior*) alder (*Alnus glutinosa*), willows (*Salix* spp) and locally, oak (*Quercus robur*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[1016] Desmoulin's Whorl Snail		
Distribution: occupied sites	Number	No decline. Two known sites: Borris Bridge, Co. Carlow S711503; Boston Bridge, Kilnaseer S338774, Co. Laois.
Population size: adults	Number per positive sample	At least 5 adults snails in at least 50% of samples
Population density	Percentage positive samples	Adult snails present in at least 60% of samples per site
Area of occupancy	Hectares	Minimum of 1ha of suitable habitat per site
Habitat quality: vegetation	Percentage of samples with suitable vegetation	90% of samples in habitat classes I and II
Habitat quality: soil moisture levels	Percentage of samples with appropriate soil moisture levels	90% of samples in moisture class 3-4
[1029] Freshwater Pearl Mussel		
The status of the FPM as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review		
[1092] White-clawed Crayfish		
Distribution	Occurrence	No reduction from baseline
Population structure: recruitment	% occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples
Negative indicator species	Occurrence	No alien crayfish species

ATTRIBUTE	MEASURE	TARGET
Disease	Occurrence	No instances of disease
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality
[1095] Sea Lamprey		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups present
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1096] Brook Lamprey		
Distribution	% of river accessible	Access to all water courses down to first order streams
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1099] River Lamprey		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive

ATTRIBUTE	MEASURE	TARGET
[1103] Twaite Shad		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure- age classes	Number of age classes	More than one age class present
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats
Water quality- oxygen levels	Milligrammes per litre	No lower than 5mg/l
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth
[1106] Atlantic Salmon		
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA
[1355] Otter		
Distribution	% positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along riverbanks / around ponds
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 857.7ha
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 616.6km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
[1421] Killarney Fern		
Distribution	Location	No decline. Three locations known, with three colonies of gametophyte and one sporophyte colony
Population size	Number	Maintain at least three colonies of gametophyte, and at least one sporophyte colony of over 35 fronds
Population structure: juvenile fronds	Occurrence	At least one of the locations to have a population structure comprising sporophyte, unfurling fronds, 'juvenile' sporophyte and gametophyte generations
Habitat extent	m²	No loss of suitable habitat, such as shaded rock crevices, caves or gullies in or near to, known colonies. No loss of woodland canopy at or near to known locations
Hydrological conditions: visible water	Occurrence	Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations

ATTRIBUTE	MEASURE	TARGET
Hydrological conditions: humidity	Number of dessicated fronds	No increase. Presence of dessicated sporophyte fronds or gametophyte mats indicates conditions are unsuitable
Light levels: shading	Percentage	No changes due to anthropogenic impacts
Invasive species	Occurrence	Absent or under control
[1990] Nore Freshwater Pearl Mussel		
Distribution	Kilometres	Maintain at 15.5km.
Population size: adult mussels	Number	Restore to 5,000 adult mussels
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution
Habitat extent	Kilometres	Restore suitable habitat in length of river corresponding to distribution target (15.5km) and any additional stretches necessary for salmonid spawning
Water quality: Macroinvertebrate s and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality- macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93
Substratum quality: Filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (<5%)
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae

River Barrow and River Nore SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- 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.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

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

The conservation statuses for the qualifying interests of the SAC site are outlined below.

Table 5.5: Qualifying Interests of the River Barrow and River Nore SAC

CODE	QUALIFYING INTEREST	NATIONAL CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
1130	Estuaries	Inadequate	Good
1140	Tidal Mudflats and Sandflats	Inadequate	Good
1170	Reefs	Inadequate	Excellent
1310	*Salicornia* Mud	Favourable	Good
1330	Atlantic Salt Meadows	Inadequate	Excellent
1410	Mediterranean Salt Meadows	Inadequate	Excellent
3260	Floating River Vegetation	Inadequate	Good
4030	Dry Heath	Bad	Good
6430	Hydrophilous Tall Herb Communities	Bad	Good
7220	Petrifying Springs*	Inadequate	Good
91A0	Old Oak Woodlands	Bad	Good
91E0	Alluvial Forests	Bad	Excellent
1016	Desmoulin's Whorl Snail	Inadequate	Good
1029	Freshwater Pearl Mussel	Bad	Good
1092	White-clawed Crayfish	Bad	Excellent
1095	Sea Lamprey	Bad	Good
1096	Brook Lamprey	Favourable	Good
1099	River Lamprey	Unknown	Good
1103	Twaite Shad	Bad	Good
1106	Atlantic Salmon	Inadequate	Good
1355	Otter	Favourable	Excellent
1421	Killarney Fern	Favourable	Excellent
1990	Nore Freshwater Pearl Mussel	Bad	Reduced

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b & 2019c)*
***Sourced from NPWS (2020)*

6.0 ASSESSMENT OF LIKELY EFFECTS: STAGE 1 SCREENING

6.1 DISTURBANCE TO PROTECTED HABITATS AND SPECIES

The proposed development is partly within/adjacent a European site, however this part of the proposed site that is within the River Barrow and River Nore SAC is an area of buildings and artificial surfaces and is a highly modified habitat and as such would not be expected to have any in-situ effects upon a protected site through loss or destruction of habitat, fragmentation of habitat, disturbance of habitat or direct reduction in species density or diversity. The existing hard surface pathway along the north boundary of the proposed development is designated as part of the SAC. Given the proposed site's proximity to this SAC, potential ex-situ impacts must also be considered.

It is not considered that the proposed development site would contain the habitats or species for which the River Barrow and River Nore SAC has been designated. No areas of woodland exist on the development site, therefore the site does not contain any habitat which would have potential links to Old Oak Woodlands [91A0] or Alluvial Forests [91E0]. No areas of heath or marsh / swamp habitats occur on the development site, therefore the site does not contain any habitat which would have potential links to Dry Heath [4030] or Hydrophilous Tall Herb Communities [6430].

The proposed development site is located a considerable distance (approximately 49km) from the tidal stretches of the River Barrow, thus qualifying interests associated with saltwater and tidal conditions would not be present. While it is noted that the River Barrow main channel passes approximately 3m (width of Bachelors Walk) to the east of the development site, no aquatic habitats of note are present within the development site itself. Therefore, there would be no direct impacts upon designated aquatic species, due to works being outside of any potential habitat for these species.

During the site assessment, no Killarney Fern [1421] was present. In the absence of swamp, fen and marsh habitat at the site, and in the absence of historic records, it is not considered that the proposed development site would be suitable to support populations of Desmoulin's Whorl Snail.

While no evidence of otter (including holts, slides, spraints and tracks) was recorded during the ecological site walkover, given that the proposed development site is located beside the River Barrow, and given that the NBDC has records for otter within the 10km square (Tetrad - S77) in which the proposed development is located, it is possible that otter are present within the vicinity of the proposed development site along the River Barrow. The site consists of amenity grassland (improved) (GA2), scattered trees and parkland (WD5) and buildings and artificial surfaces (BL3) which are considered modified and of limited value to otter should otter be present within the vicinity. As discussed in Section 4, no aquatic habitats are present at the within the boundary of the development site. Therefore, the proposed development would not have a significant potential impact upon otter due to habitat loss or fragmentation.

The potential disturbance on protected species due to noise during the operational phase would not be considered significant, given the urban setting of the proposed development. While there would be increased noise emissions during the construction phase, these would not be considered to pose a significant risk owing to the transient nature of construction works, the construction timeframe (approximately eighteen months) any fauna within the SAC and the

general area around the proposed development site would be accustomed to human and urban noise. During the operational phase of the proposed development no water-based activities will take place at night. Therefore, there will be no significant impact on nocturnal species such as otter.

It is not considered that the operational phase of the proposed development would have the potential to significantly impact upon air quality within the area, with the potential to adversely impact upon the River Barrow and River Nore SAC, given the proposed heating system and nature of the development.

It is therefore considered that the proposed development would not result in any significant risk to the protected habitats and species of the River Barrow and River Nore SAC due to habitat fragmentation or loss, disturbance or reduction in species density or diversity.

6.2 INVASIVE SPECIES

Under Regulation 49(2) of the European Communities (Birds and Natural Habitats) Regulations 2011, save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to any plant which is included in Part 1 of the Third Schedule shall be guilty of an offence.

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

Six invasive flora species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 have been recorded by the NBDC within the 10km square (Tetrad - S77) in which the proposed development site is located; Canadian Waterweed (*Elodea canadensis*), Indian Balsam (*Impatiens glandulifera*), Water Fern (*Azolla filiculoides*), Giant Hogweed *(Heracleum mantegazzianum*), Japanese Knotweed (*Fallopia japonica*) and Nuttall's Waterweed (*Elodea nuttallii*), However, no invasive species of concern were noted as present within the boundary of the site during the site assessment.

The risk of invasive species being introduced onto the site during the construction phase of the project is considered to be low, with no import of materials with the potential to contain invasive flora species. Soils excavated during construction works would be stockpiled and removed from the site by a licenced contractor. Where possible, this soil would be reused as part of the development works.

Therefore, it is considered that there would be no significant risk to protected habitats and species as a result of invasive species from the site.

6.3 POTENTIAL IMPACTS ON WATER QUALITY

The proposed development is located within the Barrow Catchment. The Barrow River main channel, which is designated as part of the River Barrow and River Nore SAC, is located approximately 3m (width of Bachelors Walk) to the east of the development site. Wastewater is connecting to the main municipal sewer and surface water drainage is will pass through a hydrocarbon interceptor before connecting to the surface water drainage system within Carlow Town Park. In addition, water from the boat washing facility will pass through a gravity flow silt chamber with UV light for biological control. No chemicals will be used for boat washing. The water supply for the development will connect to the public mains.

During the construction phase of projects, a deterioration in water quality can arise through the release of suspended solids during soil disturbance works, the release of uncured concrete and the release of hydrocarbons (fuels and oils). A deterioration in water quality has the potential to have an adverse impact upon the qualifying interests of the River Barrow and River Nore SAC, particularly qualifying interests which have conservation objectives relating to water quality, such as White-clawed Crayfish and Atlantic Salmon.

While the proposed development area is located within a flood risk zone for the River Barrow, the development will be located behind the flood wall constructed as part of the OPW flood defence wall within Carlow Town. As no works will take place outside the boundary of the site the proposed development is not anticipated to have an impact on the hydrological regime of the area or increase flood risk elsewhere.

Construction works would be approximately eighteen months in duration. Construction works would be confined to the proposed development footprint, with no works taking place in a riparian zone, the flood defence stone wall along the River Barrow will be maintained with alterations done in consultation with the OPW. Therefore, the risk of the proposed development impacting upon water quality would be greatly reduced.

However, given the proximity of the proposed construction works to the River Barrow and SAC boundary, there remains a risk of construction related water contamination impacting upon the watercourse. It is therefore considered that control measures would need to be implemented during the construction phase of the development to ensure there are no potential adverse impacts upon the SAC.

6.4 SCREENING CONCLUSION

In order for an effect to occur, there must be a pathway between the source and the receptor (the SAC / SPA). Where a pathway does not exist, an impact cannot occur.
The proposed development site is located at the River Barrow and River Nore SAC (Site Code: 002162). As detailed above, it is considered that the proposed development would not result in any significant risk to the protected habitats and species of the River Barrow and River Nore SAC due to habitat fragmentation or loss, disturbance, reduction in species density or species diversity, or due to the potential introduction of invasive species.
However, the assessment has determined that during construction works, the proposed development has the potential to impact upon the qualifying interests / special conservation interests of the River Barrow and River Nore due to a potential deterioration in water quality. Therefore, a Natura Impact Statement is required.

7.0 ASSESSMENT OF LIKELY EFFECTS: STAGE 2 APPROPRIATE ASSESSMENT

Describe the significant effects, if any, on the relevant European site which have occurred, which are occurring or which can reasonably be expected to occur as a result of the project or plan (alone or in combination).

The proposed development has the potential to impact upon the qualifying interests of the River Barrow and River Nore SAC due to a potential deterioration in water quality during the construction phase.

During construction works, there is potential for water quality deterioration through the release of suspended solids during soil disturbance works. Suspended solids could become entrained in surface water run-off and could affect aquatic qualifying interests / special conservation interests through deposition. Nutrients can be bound in suspended solids, therefore, a significant increase in suspended solids can result in excessive eutrophication, leading to the deoxygenation of waters and subsequent asphyxia of aquatic species. An increase in sediments has the potential to impact upon fish species by damaging gravel beds required for spawning, smothering fish eggs and in extreme cases, by interfering with the gills of fish. An increase in suspended solids also has the potential to reduce water clarity, which can impact the light penetration of water and may also affect certain behaviours of aquatic fauna such as foraging success.

A potential source of chemical contamination would be from the release of hydrocarbons (oils, fuels) from construction plant, equipment and removal of home heating system. Hydrocarbons can affect water quality, potentially resulting in toxic conditions for aquatic flora and fauna. Oil films on the water surface can disrupt oxygen diffusion from the atmosphere, resulting in de-oxygen of waters.

Another potential source of contamination would be the release of uncured concrete. In the event of uncured concrete entering a waterbody, the pH would be altered locally, potentially leading to the death of aquatic flora and fauna and an alteration to the waterbody substrate.

The tables below briefly outline the occurrence of the qualifying interests of the River Barrow and River Nore SAC in relation to the proposed development site, taking cognisance of the NPWS "*Conservation Objectives: River Barrow and River Nore SAC 002162*", in addition to Volumes 1, 2 and 3 of the 2019 NPWS Reports, "The *Status of EU Protected Habitats and Species in Ireland*".

The following Table 7.1 also outlines which of the qualifying interests and special conservation interests may be impacted upon by a potential deterioration in water quality from the proposed development.

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[1130] Estuaries [1140] Tidal Mudflats and Sandflats [1170] Reefs [1310] Salicornia Mud [1330] Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*)	The proposed development is located outside the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). The nearest examples of these qualifying interests are located approximately 49km downstream of the proposed development (NPWS, 2011). Given the considerable distance, it is not anticipated that the development would have the potential to negatively impact upon these qualifying interests.	No
[3260] Floating River Vegetation	The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). While this habitat is noted in the SAC site synopsis as being represented in the River Barrow and its tributaries. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	Yes
[4030] Dry Heath	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). The SAC Conservation Objectives report notes that the spatial extent of this habitat is currently unmapped, but is indicated as occurring on steep, free-draining river valley sides. Dry heath is a terrestrial habitat, therefore a potential deterioration in water quality during construction works would not be anticipated to have a significant adverse impact upon this qualifying interest should it be present adjacent the Barrow River.	No
[6430] Hydrophilous Tall Herb Communities	The proposed development is located within the current known distribution, the current range and favourable reference range of this qualifying interest (NPWS, 2019b). The SAC Conservation Objectives report notes that the distribution of this habitat within the SAC site is currently unknown, but is considered to occur at some riverside woodlands, river islands and in narrow bands along the floodplain of slow-flowing river stretches. Water quality is not listed as a conservation objective for this qualifying interest. It is therefore not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[7220] Petrifying Springs*	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). The nearest example of this qualifying interest is located at the River Nore (NPWS, 2011). Given the considerable distance and that it is above the tidal reach of the River Nore, it is not anticipated that the proposed development would have direct or indirect negative impacts upon this qualifying interest.	No
[91A0] Old Oak Woodlands	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, old oak woodlands are located approximately 41km downstream of the proposed site. However, the report notes that further unsurveyed areas may be present within the SAC. Old oak woodlands are a terrestrial habitat, therefore a potential deterioration in water quality during construction works would not be anticipated to have a significant adverse impact upon this qualifying interest.	No
[91E0] Alluvial Forests*	The proposed development is located within the current range, favourable reference range and the current known distribution of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, alluvial forests are located approximately 8.7km downstream of the proposed site. However, the report notes that further unsurveyed areas may be present within the SAC. A potential deterioration in water quality would not be anticipated to have a significant adverse impact upon this qualifying interest. However, precautionary protective measures would need to be undertaken during construction works.	Yes
[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)	The Desmoulin's whorl snail is the largest of the whorl snail species occurring in wetlands in Ireland. It favours damp or wet habitats such as swamps, fens and marshes, where it lives mostly in moss, leaves and decaying vegetation (NPWS, 2019c). Desmoulin's whorl snails feed on living and dead stems and leaves of tall plants in wetland habitats. The proposed development is located outside the current known distribution and current range but within the favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Desmoulin's whorl snail is located approximately 33km, downstream of the proposed development site. The nearest records on the NBDC for Desmoulin's whorl snail are considerable distance (upstream and downstream) from the proposed development site. Given the distance downstream of the nearest record of this qualifying interest from the development site, and given that water quality is not listed as a conservation objective for this	No

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	qualifying interest, it is not anticipated that the proposed development would have the potential to adversely impact upon the Desmoulin's whorl snail.	
[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1990] Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)	Freshwater pearl mussels (both *Margaritifera margaritifera* and *M. m. durrovensis*) are long-lived, bivalve molluscs found in clean, fast-flowing rivers. *M. margaritifera* is widespread in Ireland, however, the population has been in decline for a long time, with the current decline attributed to a combination of hydrological and morphological changes, sedimentation and enrichment of its habitat (NPWS, 2019a). The Nore pearl mussel (*M. m. durrovensis*) is a hard-water form of the freshwater pearl mussel and is only found within the River Nore's main channel. Previously, the Nore pearl mussel was reported separately as taxon 1990 (*M. durrovensis*), however genetic research has since placed the Nore population within the *Margaritifera margaritifera* taxon (NPWS, 2019c). The species has an unusual life cycle. Eggs develop into the larval stage (glochidia), which are brooded in the female gills before being released into open water. A small number are inhaled by passing salmonid fish, which act as the mussels' temporary hosts. Once mature enough to exist independently, they fall off their hosts and bury into gravel where they filter feed (Moorkens, 2000). The proposed development is located outside the current known distribution, current range and favourable reference range of the freshwater pearl mussel (NPWS, 2019c). The SAC Conservation Objectives report notes that the status of *Margaritifera margaritifera* as a qualifying interest for the site is currently under review, while *M. m. durrovensis* is confined to a 15km (approximate) stretch of the River Nore, this is located above the tidal reach of the River Nore. There are no NBDC records for pearl mussel within the vicinity of the proposed development. The Freshwater Pearl Mussel Strategic Environmental Assessment (DoEHLG, 2010a) and Freshwater Pearl Mussel Nore Sub-Basin Management Plan (DoEHLG, 2010b) reports note that the River Nore is failing in its habitat quality and population demographic profile. The catchment fails most of the requirements as specified in the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. The population in the Nore is known to be critically endangered, with evidence that there has been no recruitment for some time. Freshwater Pearl Mussel are sensitive to sedimentation and nutrient enrichment. Furthermore, as the larval stages rely on salmonid fish hosts, any potential impact on salmonid fish can have an impact upon the	Yes Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	Pearl Mussel. Water quality downstream of the proposed development will not have a direct impact on the populations that exist within the River Nore as the population exists above the tidal reach, there remains a possibility that water quality could impact on salmonid fish. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	
[1092] White-clawed Crayfish (*Austropotamobius pallipes*)	The White-clawed Crayfish is the only native crayfish species found in Ireland and is a relatively long-lived species with a maximum life of 10 years. It occurs in both streams and lakes in Ireland and requires relatively hard water with a pH of 7 or above and calcium concentrations of at least 5mg/l. White-clawed crayfish are omnivorous, with young crayfish more reliant than adults on animal foods. The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The SAC Conservation Objectives report notes that crayfish are present almost throughout the SAC. According to the Conservation Objectives report, the nearest records for white-clawed crayfish are located within the River Barrow, approximately 8.55km downstream from the proposed development. The NBDC has records for this qualifying interest approximately 1km upstream of the proposed development site and within the River Burren (approximately 760m from proposed site). The conservation status of crayfish in the SAC is dependent on good water quality status, as this species requires clean water (Q3-4). Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	Yes
[1095] Sea Lamprey (*Petromyzon marinus*)	Sea lamprey are an anadromous species, with adults living at sea and migrating to freshwater for spawning in late May or June. The fertilised eggs hatch within days, with the larvae burrowing into fine sediment where they filter feed for a number of years. Transformation to young adults occurs in summer and young adults can be found migrating downriver to estuarine waters in autumn – winter. The proposed development is located outside the current known distribution, current range and favourable reference range of the Sea Lamprey (NPWS, 2019b). The SAC Conservation Objectives report notes that upstream migration may be inhibited by artificial barriers, and that artificial barriers are currently preventing juvenile lampreys from accessing the full extent of suitable habitat.	Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	Changes in water quality have the potential to impact on the population of Sea Lamprey, the main water quality impacts are from agricultural runoff however potential pollutants from construction runoff cannot be ruled out therefore mitigation measures must be put in place to prevent changes in water quality.	
[1096] Brook Lamprey (*Lampetra planeri*) [1099] River Lamprey (*Lampetra fluviatilis*)	The brook lamprey is the smallest of the three lampreys native to Ireland and is the only species that is non-parasitic and spends all its life in freshwater. Adults spawn in spring, excavating shallow nests in gravel areas of reduced flow. Adult fish die after spawning. After hatching, larvae drift/swim downstream to areas with a fine silt composition. They burrow into this bed material and live as filter feeders for years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn. River lamprey are an anadromous species, with adults living at sea and migrating to freshwater for spawning in March and April. The adult fish die after spawning. The fertilised eggs hatch within days, with the larvae burrowing into fine sediment where they filter feed for a number of years before transforming into adult fish. The young river lamprey then migrate downriver to estuarine waters. River and brook lamprey are indistinguishable as larvae. The mature adult forms are distinguishable on the basis of body size. Lamprey surveys have necessarily focussed on juvenile lamprey. Consequently, the vast majority of available data relates to "*Lampetra* sp." and cannot be assigned to one species or the other. The proposed development is located within the current known distribution, current range and favourable reference range of brook lamprey, but outside of the current known distribution, current range and favourable reference range of river lamprey (NPWS, 2019c). The SAC Conservation Objectives report notes that diffuse source pollution maybe having localised impacts on populations of *L. fluviatilis*. Water quality impacts are from runoff have the potential to impact on the populations of both species. Therefore, there is potential for the proposed development to have an impact upon these qualifying interests due to a potential deterioration in water quality during construction works.	Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[1103] Twaite Shad (*Alosa fallax*)	Twaite Shad spend most of their life in estuaries and coastal waters but migrate upriver to spawn in late spring. Following spawning, adult Twaite Shad return to estuaries. Limited knowledge indicates that Irish Twaite Shad may live in estuarine waters for at least two full years prior to going to sea. The proposed development is located outside the current known distribution, current range and favourable reference range of the Twaite Shad (NPWS, 2019c). The nearest records on the NBDC for Twaite Shad are located approximately 49km downstream from the proposed development site. However, gravel beds for spawning must be free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth. Pollution from runoff is both a pressure and threat to this species. Therefore, precautionary protective measures would need to be undertaken during construction works due to a potential deterioration in water quality.	Yes
[1106] Atlantic Salmon (*Salmo salar*)	Atlantic Salmon use rivers to reproduce and as nursery areas. Eggs are deposited during winter in river gravels. The eggs hatch into alevins in spring, which in turn develop into fry. The fry feed for the summer and autumn, gradually becoming parr. Fry and parr feed primarily upon invertebrates. The Irish population generally comprises fish that spend two winters in freshwater before going to sea in spring as smolts. Adults spend 1-3 years at sea, feeding upon crustaceans and fish as they migrate to feeding grounds in the North Atlantic. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer, as grilse. The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). Salmon are present throughout much of the Barrow catchment, and the River Nore is designated as a Salmonid Water EC (Quality of Salmonid Waters) Regulations (S.I. no. 293 of 1988). It is probable that Atlantic Salmon are present within the vicinity of the proposed development. Atlantic Salmon. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	Yes
[1355] Otter (*Lutra lutra*)	Otters have two basic requirements: aquatic prey and safe refuges where they can rest. Otters are opportunistic predators with a broad and varied diet. In freshwater areas, a variety of fish will be taken, while crayfish and frogs can be important locally or seasonally. The proposed development is located within the current distribution, current range and favourable reference range of otter (NPWS, 2019c). The NBDC has recent	Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	otter records approximately 393m south of the proposed development site. The National Otter Survey of Ireland 2010/12 (Reid *et al.*, 2013) report noted that the occurrence of otter within survey sites for the south-eastern river basin district was 70.8%. While no evidence of otter (including spraints and tracks) were recorded during the site assessment, given the proximity of the River Barrow to the development site and given the NBDC records within proximity, it is likely that otter are within the vicinity of the proposed development. A significant impact on water quality could indirectly impact upon this qualifying interest by causing a reduction in prey populations and availability. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during.	
[1421] Killarney Fern (*Trichomanes speciosum*)	The Killarney fern is a type of filmy fern, with characteristically thin, membranous, translucent fronds. This fern grows in deeply shaded, humid areas such as dripping caves, crevices and overhangs of cliffs, within stream gullies, by waterfalls and on the floor of damp woodlands (NPWS, 2019c). The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Killarney fern to the proposed site is located approximately 41km downstream of the proposed development site. The NBDC has no records within the proposed development site. It is therefore not anticipated that the proposed development would have any adverse impacts upon this qualifying interest.	No

River Barrow and River Nore SAC Conservation Objectives

The relevant site-specific conservation objectives for the qualifying interests which have been identified as being potentially impacted upon by the development are outlined below.

Floating River Vegetation
Suspended Sediment: The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments.
Nutrients: The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition.

Freshwater Pearl Mussel (*Margaritifera margaritifera*)
The status of this species as a qualifying species for this site is currently under review and no conservation objectives are available.

Alluvial Forests
A potential deterioration in water quality may have an impact upon this habitat.

White-clawed Crayfish (*Austropotamobius pallipes*)
Water quality (EPA Q value): At least Q3-4 at all sites sampled by EPA

Sea Lamprey (Petromyzon marinus)
A potential deterioration in water quality may still impact upon this species.

Brook Lamprey (*Lampetra planeri*) and River Lamprey (*Lampetra fluviatilis*)
None in relation to water quality. However, a potential deterioration in water quality may still impact upon this species.

Twaite Shad (Alosa fallax)
A potential deterioration in water quality may still impact upon this species.

Atlantic Salmon (*Salmo salar*)
Water quality (EPA Q value): At least Q4 at all sites sampled by EPA

Otter (*Lutra lutra*)
Fish biomass available: A potential deterioration in water quality may affect fish populations and availability.

Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)
Water quality: Restore water quality to an ecological quality ratio of greater than 0.90 for macroinvertebrates and greater than 0.93 for phytobenthos.
Host Fish: Maintain sufficient juvenile salmonids to host glochidial larvae. A potential deterioration in water quality may affect fish populations.

8.0 MITIGATION MEASURES

This assessment has determined that the proposed development has the potential to impact upon the River Barrow and River Nore SAC due to a potential deterioration in water quality during the construction phase. As discussed in Section 7, it is considered that the proposed development has the potential to impact upon the following qualifying interests / special conservation interests of the SAC:

- [3260] Floating River Vegetation
- [1029] Freshwater Pearl Mussel
- [1092] White-clawed Crayfish
- [1095] Sea Lamprey
- [1096] Brook Lamprey
- [1099] River Lamprey
- [1103] Twaite Shad
- [1106] Atlantic Salmon
- [1355] Otter
- [1990] Nore Freshwater Pearl Mussel
- [91E0] Alluvial Forests

See accompanying CEMP (Document Ref: PES_CEMP_21034) for a full list of mitigation measures during the construction phase. Measures that would be employed to ensure that there would be no significant impacts to the listed habitats or species, as listed above, of the River Barrow and River Nore SAC due to a potential deterioration in water quality:

Mitigation measures in brief to be implemented are:

- The construction contractor would adhere to standard construction best practice, taking cognisance of the CIRIA guidelines, "*Control of Water Pollution from Construction Sites; guidance for consultants and contractors*" 2001 and "*Control of Water Pollution from Construction Sites – Guide to Good Practice*", 2002, in addition to Inland Fisheries Ireland guidelines, "*Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*";
- Daily visual inspections would be undertaken of the River Barrow adjacent the development site during construction works;
- Excavations and earth-moving activities would be planned outside periods of heavy rainfall, to limit the potential for suspended solids to become entrained within surface water run-off;
- Following the installation of the silt fencing along the site boundary with the River Barrow construction plant would mainly access the site via Barrow Street;
- Where spoil from earth-moving activities is generated, this would be stored at a designated area in the western portion of the site. Spoil would be stored temporarily (until used in reinstatement works or transported offsite by licenced haulier), and where possible would be covered or, alternatively, graded to avoid ponding or water saturation. Where required, silt fencing would be placed adjacent the storage area for stockpiled soil;
- Should water be encountered during excavation works, water would be pumped to a constructed silt control feature, such as a settlement pond. A filter would be provided at the pump inlet and, where required, dewatering bags or silt fences would be used at the outlet to retain any potential silt entrained in the water. Pumping operations would be supervised at all times;

- Manhole covers and stormwater gullies will be protected by silt blankets, silt fencing and additional measures such as sandbags to be incorporated on steeper gradients;
- All public roads adjacent the development site would be inspected regularly and cleaned where necessary;
- All construction plant machinery and equipment would be maintained in good working order and regularly inspected. Where construction plant shows signs of hydrocarbon leakage, site personnel would cease the operation of the item in question. Any defective plant would be kept out of service until the necessary repairs are undertaken;
- Should the construction contractor need to store hydrocarbons required for construction plant onsite, or should waste fuel / oil arise, these materials would be stored within a designated area within the site's western portion, and would be stored in accordance with the EPA guidance on the storage of materials, with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers;
- Where appropriate, small construction plant equipment would be placed on drip trays;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be readily available onsite. In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material would be properly disposed of to an authorised waste contractor;
- Where re-fuelling of construction plant is required onsite, re-fuelling would take place within on the concreted yard away from all possible drainage channels;
- Pre-cast concrete would be used over uncured concrete where possible. Any uncured concrete works would be supervised and would be scheduled outside of periods of expected heavy rainfall. Concrete would be poured directly into the shuttered formwork from the Ready-Mix Truck, reducing the risk of spillage;
- The wash-out of Ready-Mix Truck drums would not be permitted onsite, in the environs of the site, or at a location which could result in a discharge to surface water. Surplus uncured concrete would be returned to the batching plant where possible;
- In the unlikely event of a suspected deterioration in water quality within the Barrow River at the development site due to construction works at the development site, works would immediately cease and an investigation into the cause undertaken and the relevant NPWS and Inland Fisheries Ireland personnel informed.

In addition to the above measures, the construction works contractor would take cognisance of the following guidelines:

- CIRIA, 2001: *Control of Water Pollution from Construction Sites; guidance for consultants and contractors*;
- CIRIA, 2002: *Control of Water Pollution from Construction Sites – Guide to Good Practice*;
- IFI, 2016: *Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*;
- NRA 2008: *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes.*

It is therefore considered that due to the proposed mitigation measures, there would be no significant risk to water quality and the protected habitats and species of the River Barrow and River Nore SAC during the construction phase of the proposed development.

9.0 IN COMBINATION EFFECTS

The following plans and projects were reviewed and considered for in-combination effects with the proposed development:

- Carlow County Development Plan 2015-2021;
- County Carlow 2021 Local Economic and Community Plan 2016-2021;
- Proposed and permitted developments in the area available on Carlow County Council planning system.

The proposed development is located within Carlow Town. It is on the western bank of the River Barrow, approximately 130m north of Bridge St. The land use of the surrounding area is mainly urban, with a mixture of commercial and residential properties along the western boundary of the site. Carlow Town Park is located on the northern boundary of the site. There are commercial enterprises within Strawhall Industrial Estate, Carlow Gateway Business Centre, Barrowside Business Park and the general area. There are a number of recent developments within the vicinity of the proposed developments summarised in Table 9.1 below.

Table 9.1: Recent Planning Applications Close to the Proposed Site

Application No.	Development Type	Outcome	Approximate Distance
2014	Permission for a 24-hour access, self-storage facility consisting of temporary container units, permanent reception and guest washroom facilities and all associated works	Granted - Conditional	474m N
19478	Permission for the refurbishment of the existing store (3892sqm) including retail, staff area, stock room, external envelope, new plant buildings (29.16sqm) and replacement roof to the retail store.	Granted - Conditional	574m SE
19198	Permission for the demolition of an existing retail unit / commercial building (Unit 27) comprising 874 sqm and the construction of 1 no. two-storey retail unit of 3,732 sqm (gross floor area) with ancillary office and staff facilities and all associated ancillary development works including the provision and relocation of parking, access roads, footpaths, drainage and landscaping	Granted - Conditional	905m SE
16373	Planning Permission for alterations to front and side facades of existing Mercedes Benz showroom including new projecting roof canopy with circular column supports alterations to existing front entrance portal and new illuminated building signage	Granted - Conditional	1.1km E
18198	Permission to demolish and remove all existing single storey and two storey structures currently on site	Granted - Conditional	536m E

Application No.	Development Type	Outcome	Approximate Distance
	(formerly Dooley Motors Site), removal of all underground storage tanks and hardstand areas, removal of perimeter walls and replacement with 2.5m high boundary panel and all associated site works.		
15132	Permission for construction of alterations and additions to the existing District Hospital structure to comprise demolitions and extensions to rear courtyard area and entrance elevation and alterations to front west facing elevation, together with provision of a hospice/palliative care facility	Granted - Conditional	740m NE
16112	Change of use to an existing building from existing commercial building to indoor recreational facility to include indoor go karting, bubble soccer/roller skating, trampolines and other indoor activities.	Granted - Conditional	1.1km NE
1955	Permission for modifications to the 'Beet Lab' storage unit, to comprise of a two-bay extension to northern elevation, modifications to existing roller door and the relocation of well	Granted - Conditional	1.5km NE
146603	Permission for the construction of a hurling ball ally, with tarmacadam surface and the erection of 1 no. floodlight including all related site works located on site	Granted - Conditional	1.8km NE

Potential in-combination effects are discussed under the following headings.

9.1 HABITAT LOSS / FRAGMENTATION

As discussed in Section 6.1 the proposed development is partly within/adjacent a European site, however the part of the proposed site that is within the River Barrow and River Nore SAC is an area of buildings and artificial surfaces and is a highly modified habitat and as such would not be expected to have any in-situ effects upon a protected site through loss or destruction of habitat or fragmentation of habitat. With regards ex-situ effects, it is not considered that the proposed development site would contain the habitats or species for which the River Barrow and River Nore SAC has been designated.

The surrounding land-use of the proposed development site is mainly urban which can be considered modified and of low biodiversity value. The River Barrow is of high biodiversity value. Developments were identified on the Carlow County Council planning site within the vicinity of the applicants proposed site and are a mixture residential and commercial developments within Carlow Town. Should future planning applications be submitted for the area, it is likely that they would also be located within the town limit of Carlow or on land identified for commercial/residential use. Therefore, it is unlikely that future proposed developments would result in the loss or fragmentation of designated habitats of the River Barrow and River Nore SAC within the vicinity of the proposed site. Therefore, no in-combination effects on habitat loss / fragmentation are anticipated.

9.2 DISTURBANCE TO SPECIES

Disturbance to species may arise through noise emissions and human activity. The main in-combination noise and human activity effects would be from any commercial and recreational activities within the area. The River Barrow and River Nore SAC is within/adjacent the site boundary and the River Barrow will be used for water-based recreational activities. Fauna within the SAC and the general area around the proposed development site would be accustomed to human and urban noise. Given the nature of the proposed development there will be no water-based activities on the River Barrow at night. During the operational phase of the development the clubs that will utilise the water activity centre will be the majority of established clubs and recreational events already in operation in Carlow Town. In addition, directional lighting will be sensitive in design and not cause a significant impact on nocturnal species.

During site construction works a total of 2037m^3 of material would be removed and would be either stored for re-use in the building phase or removed to a licenced waste facility. Where possible, no trees would be removed during the bird nesting season, from the 1st of March to the 31st of August. Therefore, owing to the urban land use and given the site is currently in use as a recreational parkland, it is considered that the development will not significantly increase cumulative noise impacts or other disturbance effects due to human activity, which would pose a significant risk to designated sites or species. See Environmental Impact Assessment Screening (PES_EIA_21271) for additional information on potential noise impact of the proposed development during the operational phase.

9.3 AIR QUALITY

From mapping websites, including the EPA's Envision mapping system, there are commercial activities within Carlow Town however there are no industrial enterprises located within the vicinity of the proposed development site. The nearest EPA licenced sites are located approximately 1.31km and 5.58km from the proposed development site. These facilities are obliged to operate their site in compliance with their IE / IPC licences, and therefore would be obliged to ensure air emissions are in compliance with any emission limit values outlined within their EPA licences.

The proposed heating system will be air to water heat pump. Air emissions would be typical of a recreational building, being primarily from heating and therefore low impact in-and-of-itself. In-combination residential impacts would be controlled by national energy policies and grant schemes. See Environmental Impact Assessment Screening (PES_EIA_21271) for additional information on potential air quality impact of the proposed development during the operational phase. During construction works the potential impact on air quality would not be significant due to the proposed mitigation measures outlined within the accompanying CEMP (Document Ref: PES_CEMP_21034). It is considered that there would be no cumulative air quality impacts which would pose a significant risk to designated sites.

9.4 DETERIORATION IN WATER QUALITY

Continued implementation of the Water Framework Directive would result in achieving, or maintaining, improvements to water quality in the Barrow Catchment. Developments such as this proposed development could act in combination with existing environmental pressures on the Barrow Catchment, including: agriculture, anthropogenic, domestic and urban waste water, urban run-off, industry and forestry. However, waste water will connect to the municipal sewer and the existing public toilets within the public park will be removed. Stormwater comprised of rainwater run-off from the roof areas and hard surfaces will connect to a new drainage system with a hydrocarbon interceptor before connecting to the existing surface water drainage system at Carlow Town Park. Water from the boat washing facility will pass through a filter system with UV light for biological control. This will prevent pathogens such as Crayfish plague from entering the River Barrow during the operational phase of the development. It is considered that there would be no cumulative water quality impacts which would pose a significant risk to designated sites.

Construction phase mitigation measures will be put in place to protect the River Barrow during construction works, these measures will include silt control features such as silt mats and silt fences that will prevent a significant impact on the water quality of the River Barrow. This will limit any significant impacts on the protected habitats and species of the River Barrow and River Nore SAC.

10.0 CONCLUSION

It is not anticipated that the proposed development, subject to recommended mitigation measures, by itself or in combination with other developments, would impact negatively upon the Natura 2000 network during the site preparation or operational phases of the project.

The proposed development site is located adjacent the River Barrow and River Nore SAC (Site Code: 002162). It is considered that there would be no potential risk of significant impacts upon the qualifying interests / special conservation interests of the River Barrow and River Nore SAC due to the proposed mitigation measures to be employed.

It is the conclusion of this Natura Impact Statement that, subject to recommended mitigation measures, there would be no potential for significant impacts on European sites as a result of the proposed development and mitigation measures to be employed. This conclusion refers to the development by itself or in combination with other developments.

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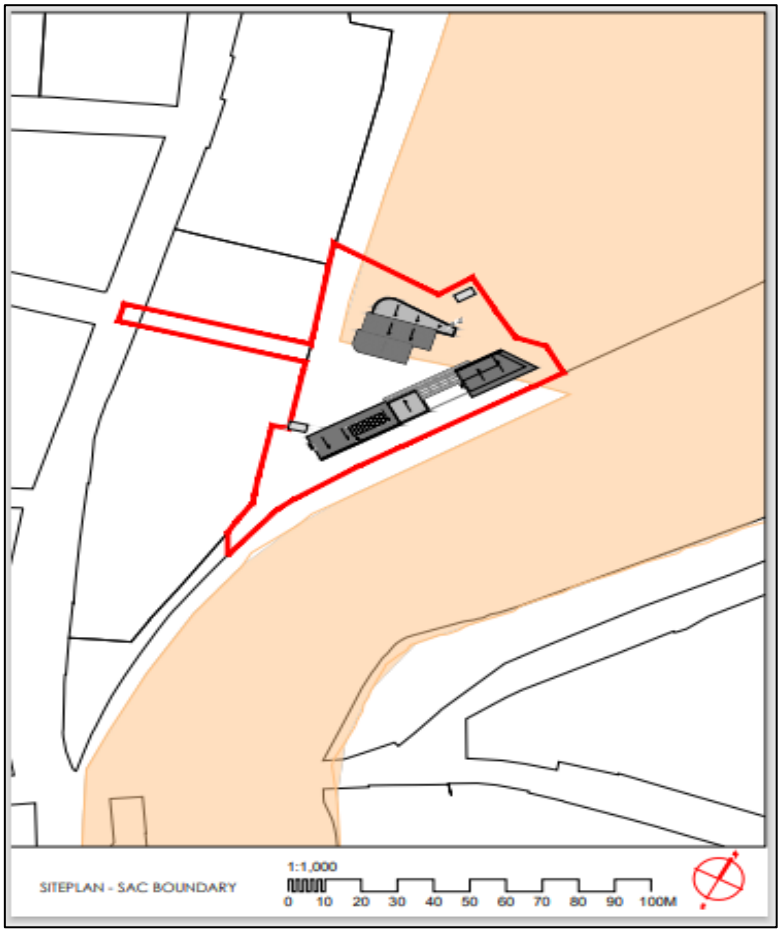
APPENDIX A

PROTECTED SITES
AND
PROPOSED SITE LAYOUT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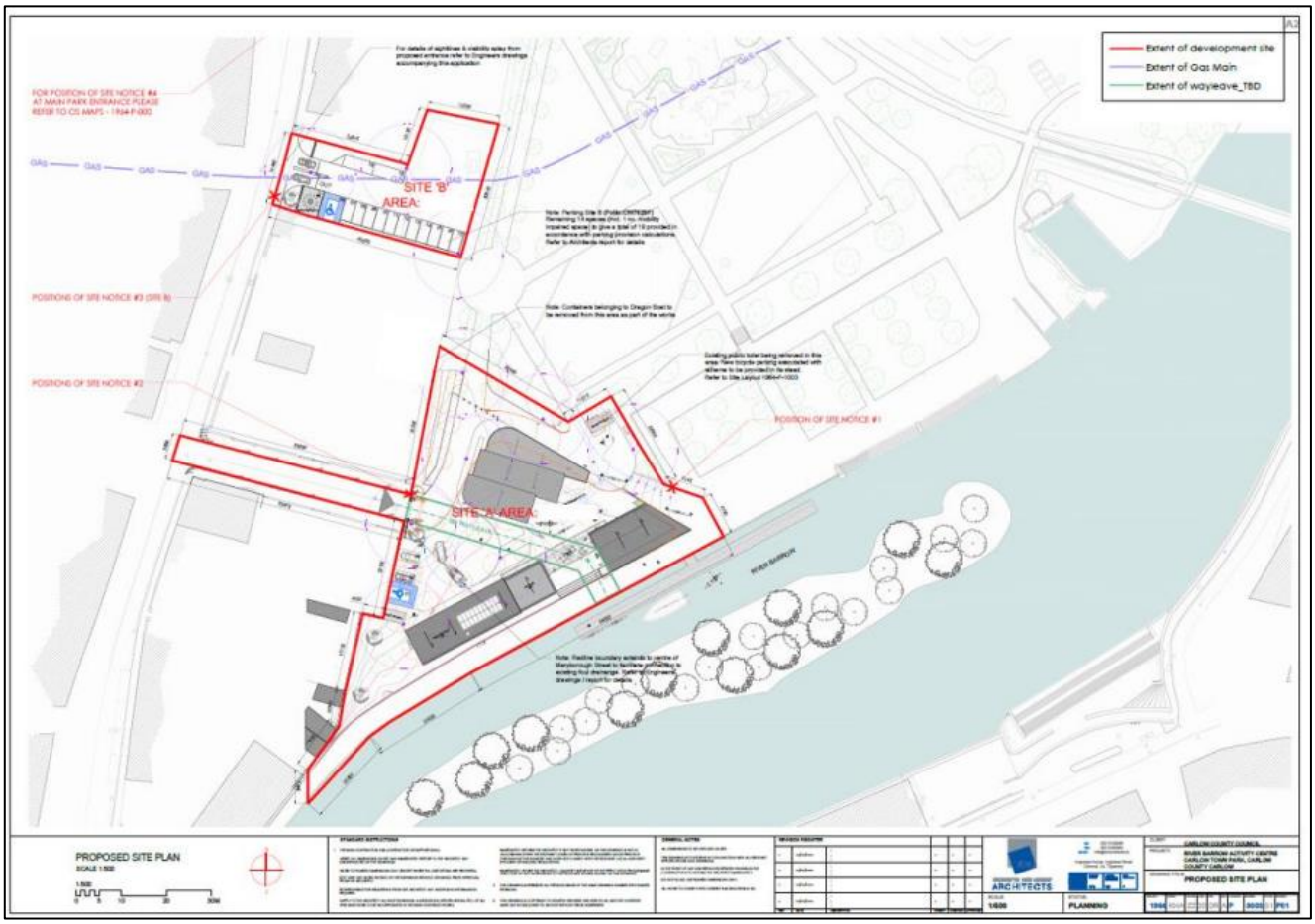
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Extent of Gas Main
Extent of wayleave_TBD
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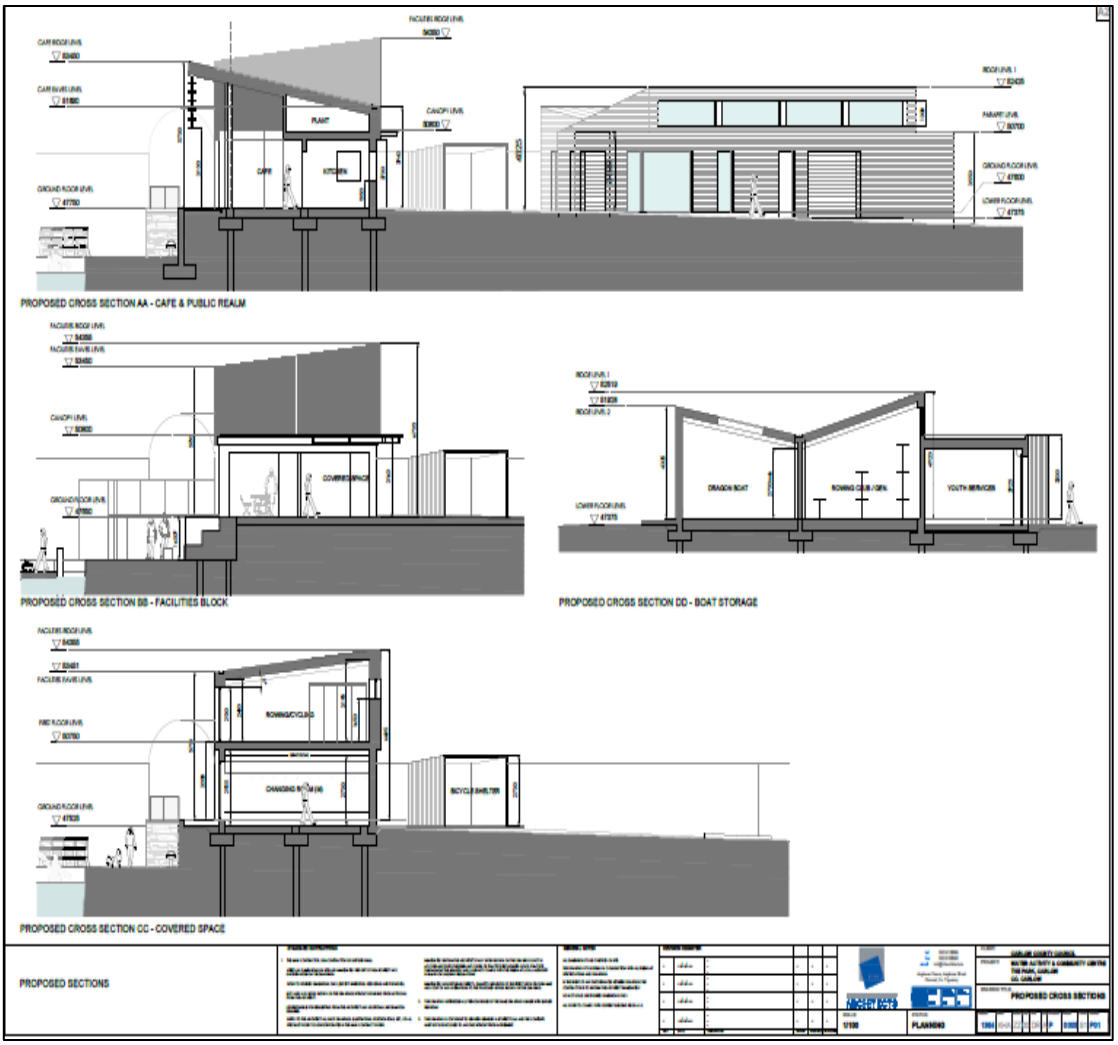
SITE 'A' AREA:
PROPOSED SITE PLAN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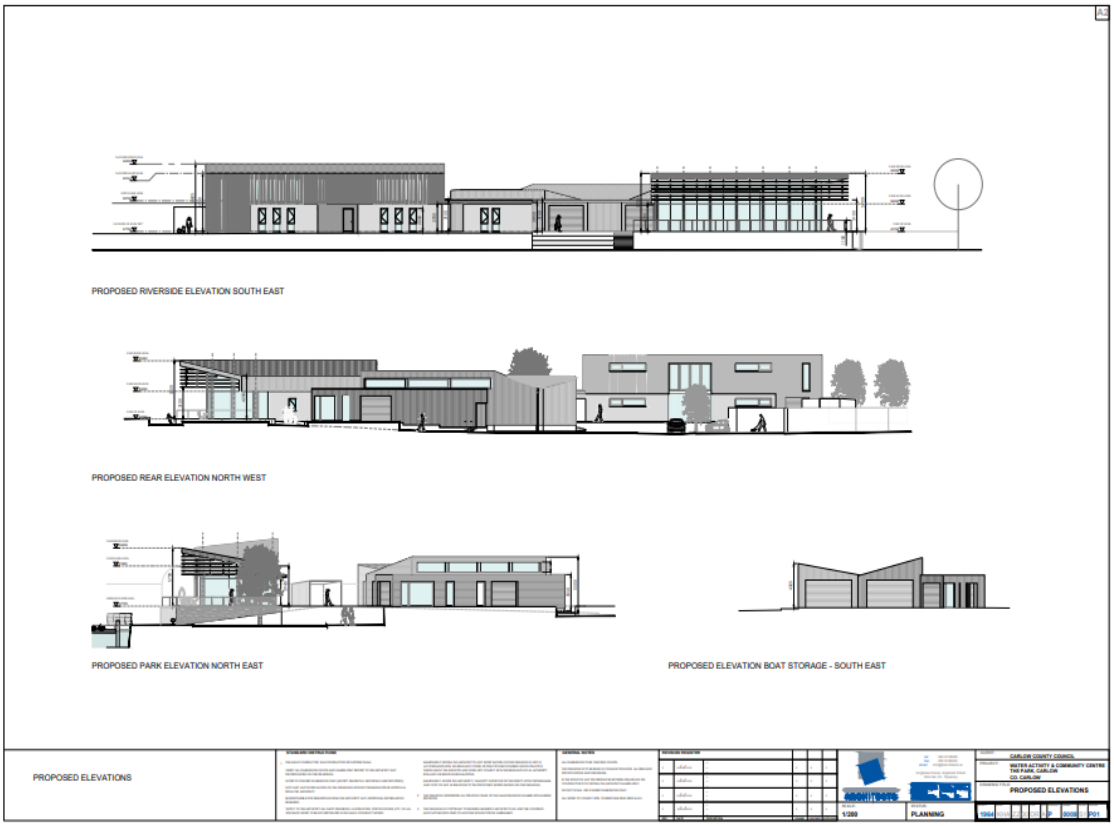
PROPOSED SECTIONS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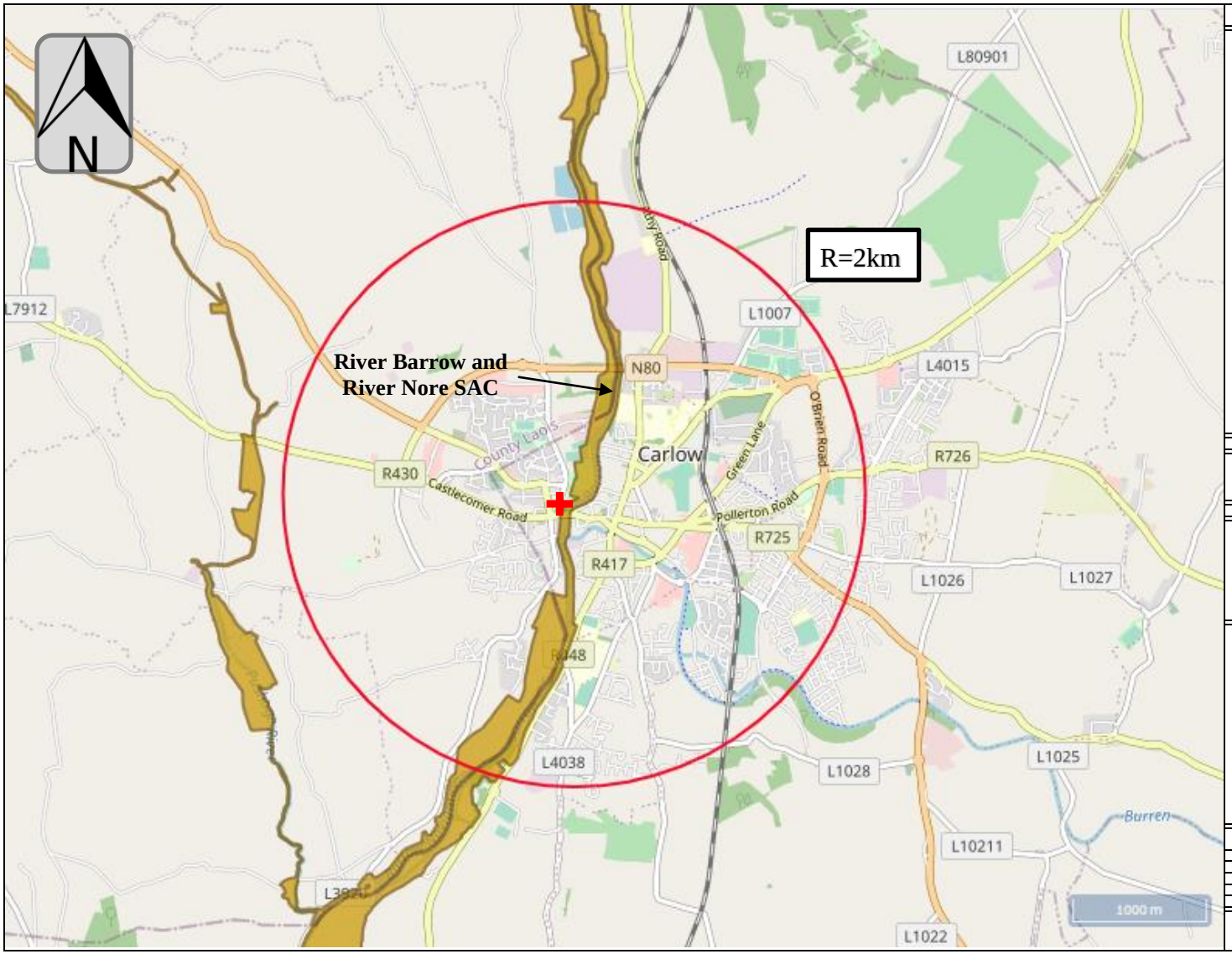
PROPOSED ELEVATIONS



Notes

- Location of Development
- SAC
- SPA

Project Title:

Protected Sites Map

Client Name:

PEOPLE'S PARK, CARLOW, CO. CARLOW

PANTHER ENVIRONMENTAL SOLUTIONS LTD

UNITS 3 & 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248

TELE: 059 91 34222
MOBILE: 087 851 9284
EMAIL:info@pantherwms.com
WEB: www.pantherwms.com

Drawing Status:	**Scale:**	NTS	A4
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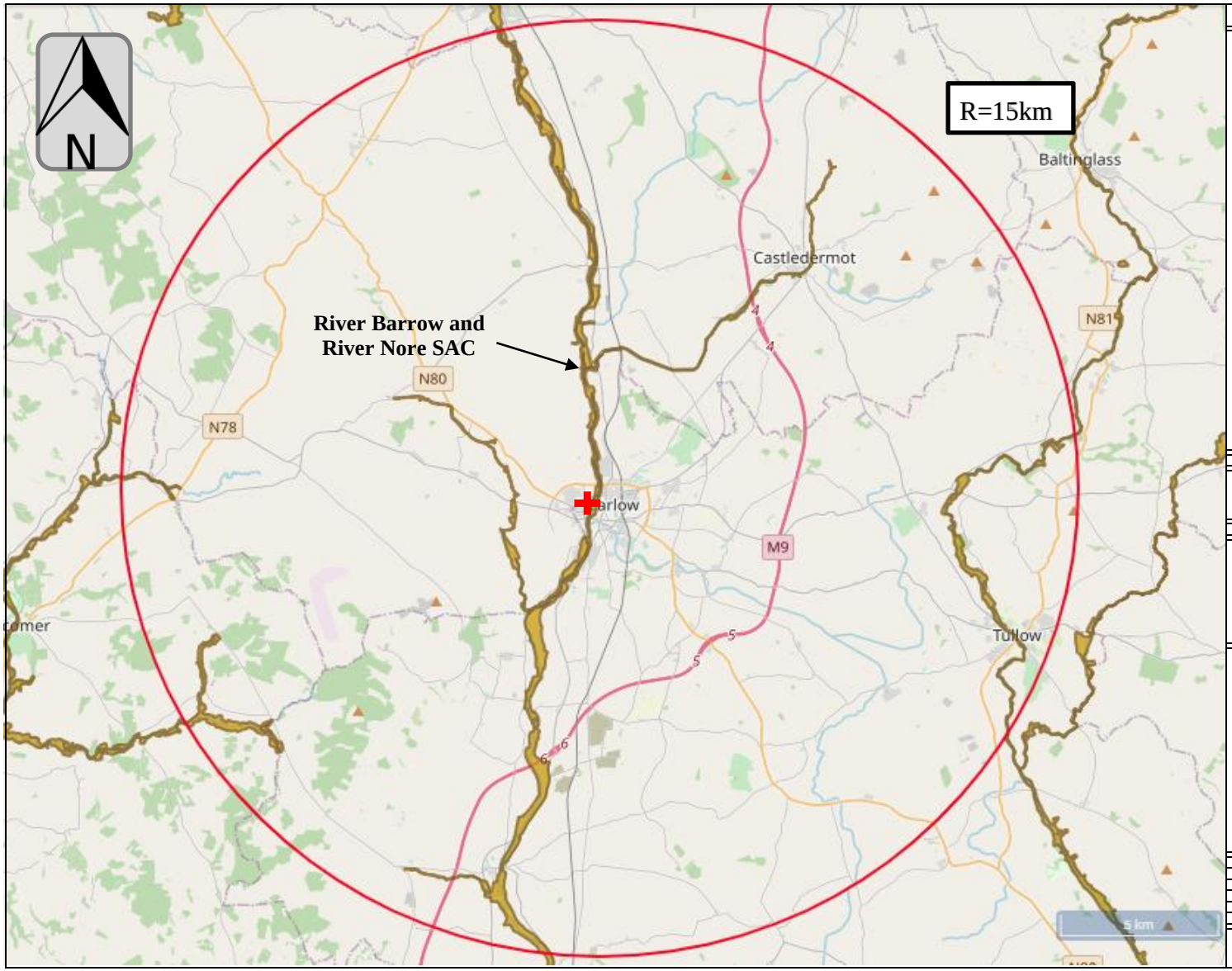
PES-21034	**Checked:**		MF
Revision:	**Approved:**		-
R0	**Date:**		11/03/2021



Notes

- Location of Development
- SAC
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R93 W248

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MOBILE: 087 851 9284
EMAIL:info@pantherwms.com
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Drawing Number:	Drawn:	PES	
PES-21034	Checked:	MF	
Revision:	Approved:	-	
R0	Date:	11/03/2021	

APPENDIX B

PHOTO LOG

Plate 1: Scattered trees and parkland (WD5) habitat

Plate 2: Improved amenity grassland (GA2) habitat

Plate 3: View of site facing south.

Plate 4: Building and artificial surfaces (BL3) habitat

Notes:

APPENDIX B
PHOTO LOG

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EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

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Plate 5: Ornamental/non-native shrub (WS3) habitat.

Plate 6: View of boundary wall with the SAC.

Plate 7: Earth banks (BL2) and Scrub (WS1) habitats

Plate 8: River Barrow - Depositing/lowland rivers (FW2) habitat

Notes:

APPENDIX B
PHOTO LOG

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