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CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

RIVER BARROW ACTIVITY CENTRE, CARLOW TOWN PARK, CARLOW

2021

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1. INTRODUCTION

Panther Environmental Solutions Ltd. was commissioned by Kenneth Hennessy Architects on behalf of Carlow County Council, to compile a Construction Environmental Management Plan (CEMP) for the proposed development of a River Barrow Activity Centre with all associated works at People's Park, Carlow, Co. Carlow.

1.1 PURPOSE OF THE CEMP

The purpose of this CEMP is to communicate key environmental obligations that apply to all site personnel, sub-contractors and visitors to the site, while carrying out construction activities as part of the proposed development. The CEMP defines the approach to environmental management at the proposed development site, outlining the work practices, construction procedures and responsibilities to be undertaken during the construction phase. Compliance with the CEMP, the procedures, work practices and controls would be mandatory and must be adhered to by all personnel and sub-contractors employed during the construction phase. The CEMP outlines, where necessary, the control measures that are required to avoid, minimise or mitigate potential effects on the environment and surrounding area.

This document has been prepared based upon the information provided during the planning stage, supplied by the applicants and their representatives, with respect to the proposed development.

1.2 LIVE DOCUMENT

The CEMP is a “live” document and would be reviewed and updated as necessary throughout the construction phase.

1.3 COMMUNICATION

Upon planning approval, the applicants would appoint a construction works contractor to the proposed development. This CEMP would be communicated to all site personnel during site inductions and briefings. All site personnel would be responsible for undertaking their work in an environmentally sustainable manner and would be encouraged to provide feedback and comments on environmental performance at the site and suggestions for improvement.

The construction works contractor would appoint a Project Manager to the proposed development. Any environmental issues, accidents or incidents would be reported to the Project Manager as soon as possible, who in turn would inform the applicants.

2. PROJECT DESCRIPTION

2.1 LOCATION

The proposed development would comprise of the construction of a River Barrow Activity Centre at Carlow Town Park as shown in Figure 2.1 below. The development will include the construction of boat storage areas measuring 310m^2, 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. 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 2.2.

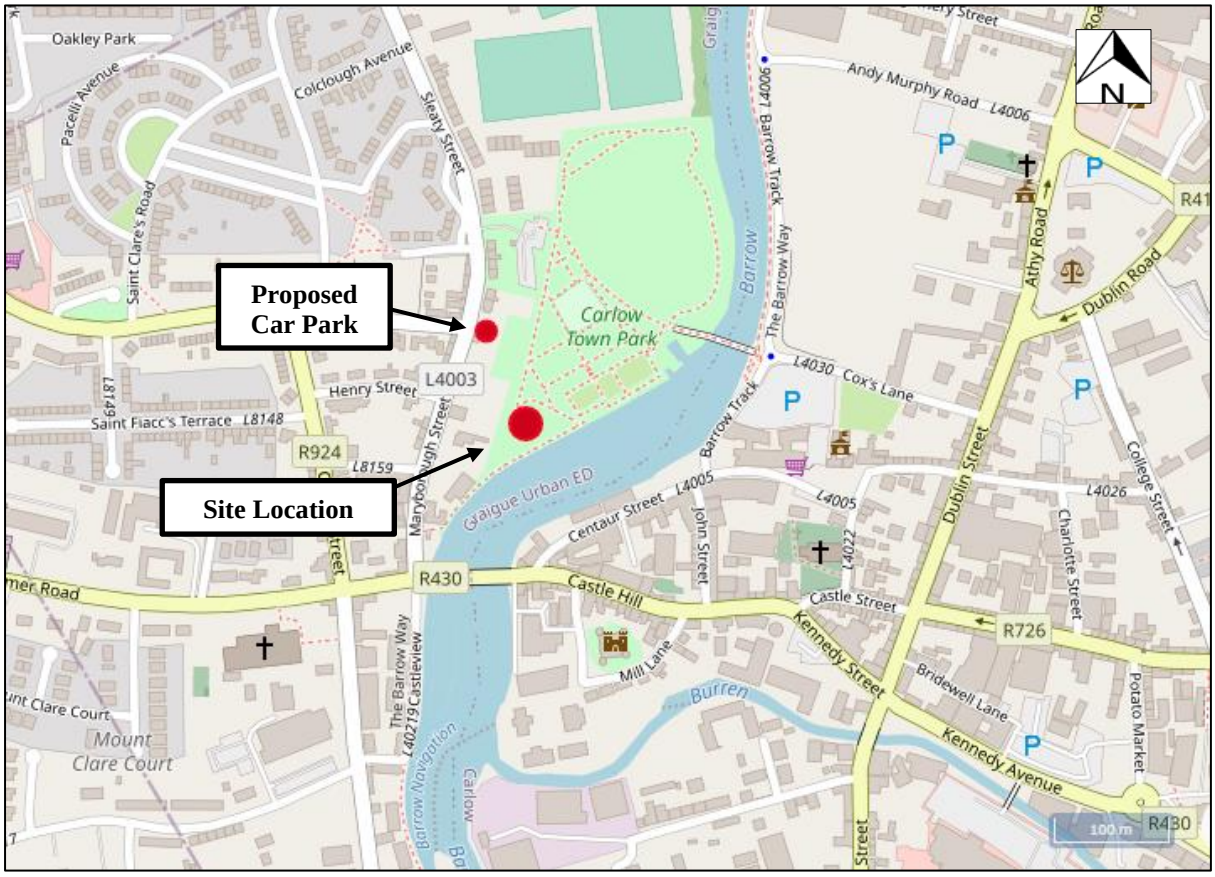

Figure 2.1: Site Location at Carlow Town Park

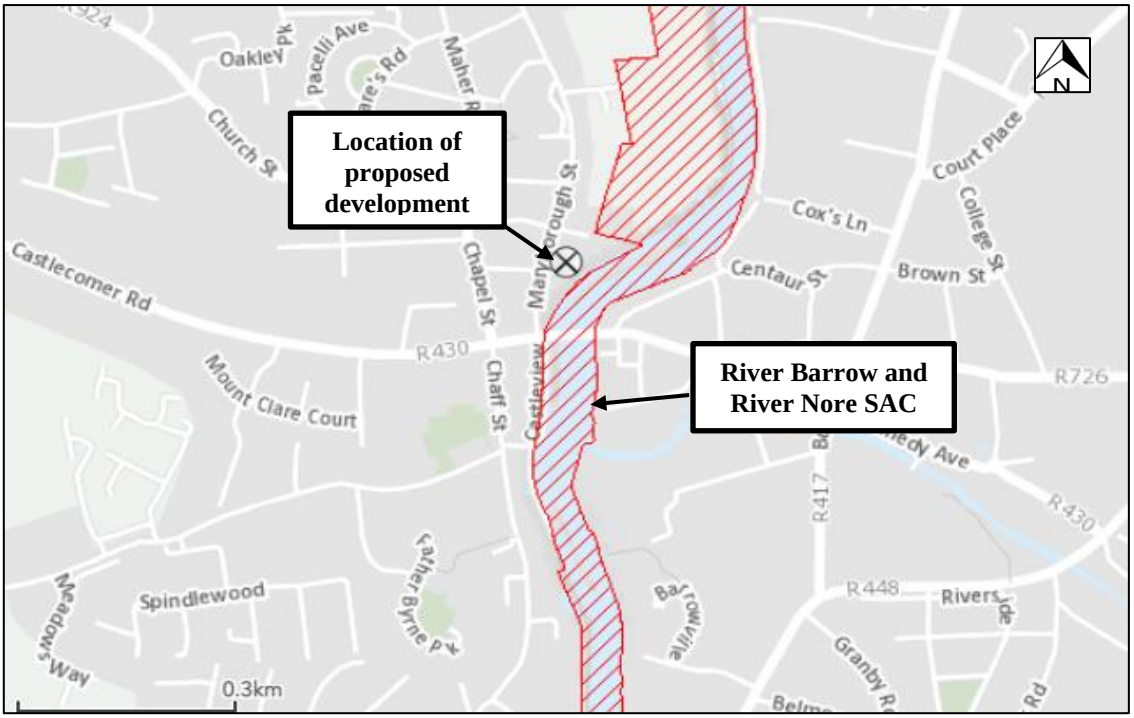

Figure 2.2: Proposed Development Relative to Protected Sites

2.2 PLANNING CONTEXT

The proposed development will 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 for training facilities, community meetings, cafe 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

As good environmental practice, this CEMP has been prepared, to ensure construction works would be undertaken in an environmentally sensitive manner.

The following sections outline the planning policies relevant to the proposed development and the protection of the environment.

National Policies

A number of documents have been published in relation to the Government's commitment to sustainable development, including the *National Spatial Strategy 2002-2020* and the *Sustainable Development: A Strategy for Ireland 1997*.

Regional Policies

The Regional Planning Guidelines for the Southeast Region 2010-2022, which includes the counties of Carlow, Kilkenny, Waterford, Wexford and South Tipperary, outlines the long-term spatial planning strategy for the area. As part of the guidelines, a number of policies relating to the protection of the environment were outlined, as per Table 2.1 below.

Table 2.1: Regional Policies Relevant to the Protection of the Environment and the Proposed Development

POLICY REFERENCE	POLICY
PPO 8.1	Planning Authorities should develop policies that identify clearly: - Environmental and Heritage resources that are to be maintained, conserved and enhanced and integrated into any development proposals involving the sites as discussed in the RPG for the area; - Proposals for environmental enhancement in towns and villages and in rural areas; - The means by which potential impacts on environmental resources are to be avoided or mitigated.
PPO 8.2	Planning Authorities should ensure that all development plans take a holistic and integrated approach to heritage and protect all relevant aspects of national heritage, including archaeological, built, cultural, natural and linguistic heritage.
PPO 8.5	Planning Authorities should devise strategies for managing development and other activities in order to achieve the objectives of the South East and South west River Basin Management Plans and associated Programme of Measures. Local authorities should ensure that common approaches are taken to the protection of surface, ground, coastal and estuarine water bodies. These approaches should, *inter alia***,** ensure that: - The impact of developments on water bodies outside as well as inside the jurisdiction of the individual authorities is considered when decisions on discharges and water extraction are being made; - Developments do not interfere with the attainment of the standards required by the Water Framework Directive; - Joint actions are taken to positively address the attainment of the standards required by the Water Framework Directive.
PPO 8.6	Planning Authorities should provide for the following biodiversity objectives through County and City Development Plans and Local Area Plans: - Protect natural heritage sites designated or proposed for designation in National and European legislation, and in other relevant International Conventions, Agreements and Processes; - Ensure that development does not have a significant adverse impact, incapable of satisfactory mitigation, on plant, animal and bird species and habitats protected by law and that developments affecting Natura 2000 sites are assessed in compliance with Article 6 of the Habitats Directive; - Maintenance and restoration of water quality in areas listed on the Register of Protected Areas under the Water Framework Directive including Freshwater Pearl Mussel Catchments; - Protection of Fisheries and Shellfisheries; - Identify and protect sites of local biodiversity interest that act as ecological corridors linking sites of conservation importance.
PPO 8.7	It is an objective of the Regional Authority to encourage and support a co-ordinated approach for protection and enhancement of the region's flood plains, wetlands and watercourses for their biodiversity and flood protection values.

POLICY REFERENCE	POLICY
PPO 8.9	Planning Authorities should ensure that River Management Policies should be an integral part of Development Plans and cover all waterways considered as a natural resource requiring protection and sustainable development. The following mechanisms for protection of the aquatic environment could be considered for inclusion in development plans: - River Corridor Management Areas which provide for the protection and sustainable development of the aquatic environment (particularly within towns and cities); - The identification and creation of linear parks along waterways incorporating preservation of the Riparian Zone along waterways and subject to compliance with Articles 6 and 10 of the EU Habitats Directive.
PPO 8.10	Local authorities should, where possible, promote awareness of invasive species in collaboration with other relevant agencies and take appropriate measures for their management and control.

Local Policies

Local planning policies are detailed in the Carlow County Development Plan, 2015-2021. A number of policies relate to the protection of the environment and are relevant to the proposed development, summarised as follows:

Table 2.2: Summary of Local Policies Relevant to the Protection of the Environment and the Proposed Development

POLICY REFERENCE	AREA
Heritage – Policy 1	Protection of biodiversity: wildlife, habitats, species and designated sites
Heritage – Policy 2	Protection of all-natural heritage sites designated or proposed for designation in accordance with European and National legislation. Screening of all projects and plans for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive.
Env. – Policy 1	Management of wastes, the "polluter pays" principle and the preparation of construction and demolition waste management plans for significant construction / demolition projects.
Env. – Policy 2	Protection of soil quality. Requirement on developments to carry out land contamination surveys where lands may have been at risk.
Env. – Policy 4	Ensuring developments do not cause unacceptable increases in noise emissions.
Env. – Policy 5	Ensuring developments do not cause significant light pollution.
Env. – Policy 6	Protection of groundwater quality. Compliance with the Urban Waste Water Treatment Regulations and the Waste Water Discharge (Authorisation) Regulations.
Env. – Policy 7	Protection of surface water quality and drinking water quality. Implementation of the Water Framework Directive.

Biodiversity Plans

Ireland's third National Biodiversity Plan 2017–2021, identifies actions towards understanding and protecting biodiversity with a vision that, "*biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally*". A number of Local Biodiversity Action Plans have been prepared, and it is

noted that the Carlow County Development Plan (CDP) includes a policy to promote increased understanding and awareness of the natural heritage and biodiversity of the county and aim to carry out a Biodiversity Plan during the lifetime of the plan

All-Ireland Pollinator Plan

In 2015, Ireland joined a number of other European countries in developing a strategy to address pollinator decline and protect pollination services. 68 governmental and non-governmental organisations agreed a shared plan, the "*All-Ireland Pollinator Plan*", which identifies 81 actions to make Ireland pollinator friendly. The plan provides recommendations for six different sectors, including farmers, county councils, communities, businesses, homeowners and schools.

2.3 ENVIRONMENTAL BASELINE

The proposed main development site, measuring approximately 0.0236 hectares and the existing site is within Carlow Town. The land use of the area is mainly urban with the River Barrow along the north-east boundary which is designated as part of the River Barrow and River Nore SAC. There are commercial buildings along Maryborough Street and historic sites such as Carlow Castle within the vicinity of the proposed site.

2.3.1 Biodiversity

As part of the preparation of this CEMP, 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 and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodologies outlined in Fossitt's "*A Guide to Habitats in Ireland*", and the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.*, 2011).

Bird species and any 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. No evidence of fauna was found on site during the survey.

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.

See accompanying Natura Impact Statement (Report No PES_NIS_21034) for complete ecological assessment of the site. The identified habitats at the proposed development site and within the vicinity of the site, as per the Fossitt habitat classification scheme, are summarised in Table 2.3 below.

Table 2.3: 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

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*), 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 during the site walkover.

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 re-

used for site levelling, therefore no importation of topsoil or subsoil would be required 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.

Fauna

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. See accompanying Natura Impact Statement (Report No PES_NIS_21034) for ecological assessment of the habitats at the proposed site.

Bats

It is possible that bats are present within the area of the proposed development, given the presence of woodlands along the River Barrow which may provide suitable foraging and commuting habitats. There are no trees/shrubs within the development sites that would offer suitable roosting potential for bats.

National Biodiversity Data Centre (NBDC) records for the previous thirty years for bats within the 10km square (Tetrad - S77) in which the proposed development is located 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*).

Designated Sites

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

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

There is no standard radius that can be used to select which European/National 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/National sites within a distance of 15km. No Special Protection Area (SPA) or Nature Reserves 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 Table 2.4 below. In addition, there is one National Heritage Area (NHA) and seven proposed National Heritage Areas (pNHA) within 15km of the proposed site.

Table 2.4: Summary of Protected European and National 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 E
Coan Bogs	NHA	001757	10.8km SW
Oakpark	pNHA	000810	3.6km NE
Cloghristick Wood	pNHA	000806	6.5km SW
Barrow Valley at Tankardstown Bridge	pNHA	000858	10.5km N
Ballylynan	pNHA	000857	11.6 km NW
Ardristan Fen	pNHA	000788	12.5km SE
Ballymoon Esker	pNHA	000797	14.1km S
Corballis Hill	pNHA	001389	14.8km NE

To determine an impact on a protected site there must be a source-pathway-receptor relationship. The site does not have a direct hydrological connection to the Slaney River Valley SAC, Coan Bogs NHA, Ballylynan pNHA, Ardristan Fen pNHA Ballymoon Esker pNHA and Corballis Hill pNHA and Oakpark pNHA. The Barrow Valley at Tankardstown Bridge pNHA is located upstream of the proposed site.

Cloghristick Wood pNHA has been designated for woodland flora such as Oak (*Quercus* spp.), Beech (*Fagus sylvatica*), Hazel (*Corylus avellana*) with Willows (*Salix* spp.) as the dominant species. The ground flora comprises a range of wetland and woodland species. Oak woodlands are not impacted by river water quality as they are a terrestrial habitat. Alluvial and Oak woodlands habitats are assessed for potential impacts in the accompany NIS (Document Ref: PES_NIS_21034) as both habitats are qualifying interests of the River Barrow and River Nore SAC.

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 hydrological connection and the distance. For a complete assessment of the River Barrow and River Nore SAC and its qualifying interests see the accompanying NIS (Document Ref: PES_NIS_21034).

2.3.2 Water Quality

The proposed development is located within the Barrow Catchment (Barrow sub-catchment, SC_090). As noted above, the River Barrow passes along the western boundary of the development site. The current WFD status of the River Barrow within proximity of the proposed development is "At Risk".

The River Barrow is designated as part of the River Barrow and River Nore Special Area of Conservation (SAC) (Site Code: 002162). The Conservation Objectives document for the River Barrow and River Nore 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.

Table 2.5: 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	1.14m Upstream
RS14B012450	Footbridge, Dolmen Hotel	270653	174173	4.95km Downstream
RS14B012600	Milford Br	269975	170430	9.38km Downstream

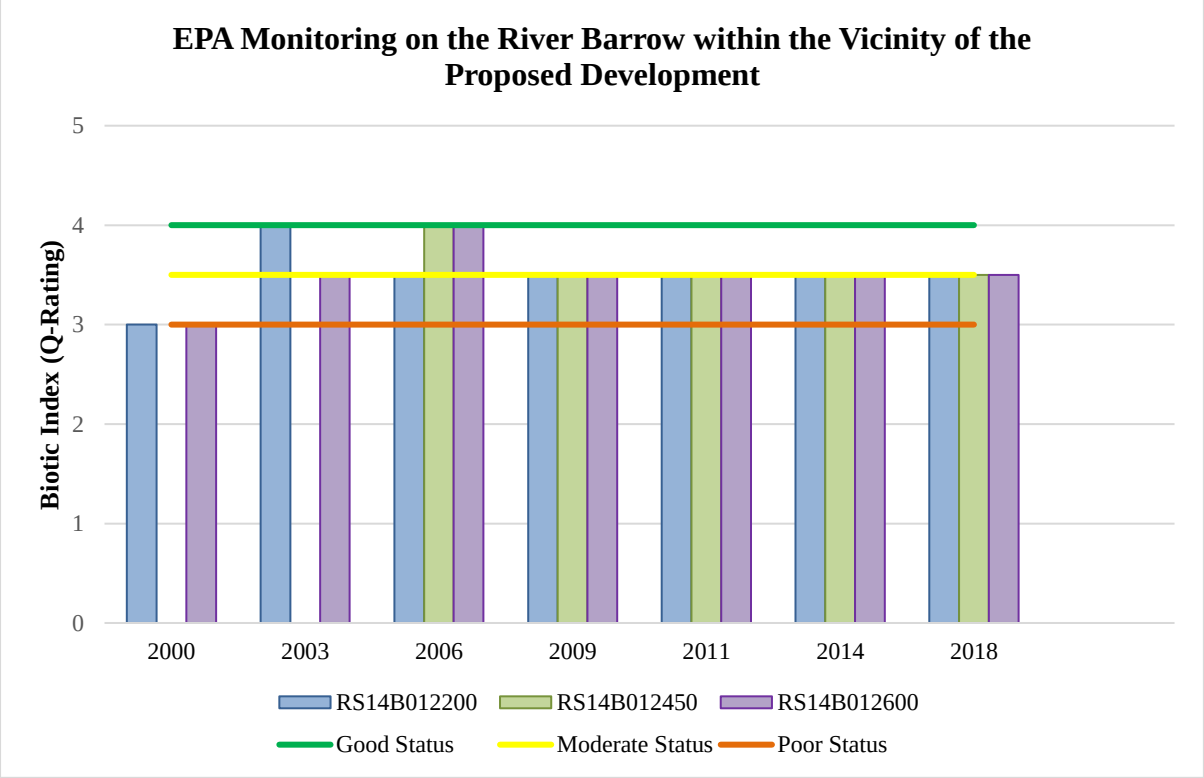

Figure 2.3: EPA Ecological Monitoring of the Barrow River from 2000 – 2018

The Environmental Protection Agency (EPA) undertake surface water monitoring along the River Barrow. The results for the nearest monitoring stations (as per Table 2.5) with available monitoring results for the period 2000 – 2018 are summarised in Figure 2.3 for indicative purposes.

As can be seen in Figure 2.3 above, the Barrow River is mainly achieving a water quality status of between Q4 (good) and Q3-4 (moderate) at the monitoring locations (Table 2.5), 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."*

2.4 CONSTRUCTION PROJECT DESCRIPTION

The construction of proposed development would be undertaken by the construction contractors, hereafter referred to as "the construction works contractor", on behalf of Carlow County Council, hereafter referred to as "the clients".

The proposed development would comprise of the construction of a River Barrow Activity Centre at Carlow Town Park. See Appendix A for proposed site layout. The development will include the construction of boat storage areas measuring 310m^2, 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. The proposed site drawings are included in Appendix A.

The expected construction timeframe would be approximately eighteen months, with hours of operation from 8am to 6pm Monday to Friday, and 8am to 2pm on Saturdays. A designated waste area and designated area of any waste materials located away from the River Barrow and any drainage system would be established by the construction works contractor within the development site boundary, appropriate measures must be taken to prevent any runoff into the River Barrow during construction works.

2.4.1 Construction Schedule

The approximate construction period for the proposed development is estimated to be eighteen months. Upon approval of the CEMP by development authority, the construction schedule would be finalised at a detailed design stage. The proposed development would include the following main construction activities:

General

- Mobilisation of personnel and equipment to site;
- Site inductions and relevant training;
- Erection of health and safety / construction works signage;
- Installation of external lighting if required;
- Site clearance, including any vegetation removal.

Remediation Works at Proposed Site and Associated Works

- Excavations and earth moving activity;
- Stockpiling of material for use in site reinstatement activities;
- There should be no storage of materials or construction works of any kind to take place within the construction exclusion zone of the River Barrow;
- Installation of silt control features where appropriate, such as silt fencing;
- Cover of drainage network with silt mats;
- Pouring of concrete;
- Works to facilitate access to the site.

Reinstatement

- Finishing of proposed development site;
- Removal from site of any excess materials remaining following reinstatement works;
- Removal of any silt control features once stabilisation has taken place / temporary storage of excavated materials has been removed.

2.4.2 Main Stages of Construction

Site Clearance and Excavations

During site clearance works, any excess material at the site will be either stored for re-use in construction activities at the development site or removed to a licenced waste facility. During excavation works, subsoil and topsoil would be temporarily stored for re-use in reinstatement where possible. Any excess materials would be transported offsite by a licenced contractor for disposal at a suitably licenced facility. Alternatively, should excess excavated materials/soils be classified as a by-product under Article 27 of the Waste Directive Regulations, 2011, and if

the proposed end use meets the requirements of the Article 27 regulations, excavated soils could be directed for local use. The storage of excavated material on site would be temporary, until the completion of site reinstatement activities.

Provision / Upgrade of Services

Following site clearance and excavations, works would commence on the installation / upgrade of underground utilities to the site required for water supply, wastewater, electricity and telecommunications.

Stormwater comprised of rainwater run-off from the roof areas and hard surfaces will connect with a new drainage system with a hydrocarbon interceptor before connecting to the existing stormwater drainage system within the vicinity of the development.

Construction of Development

Following site clearance, excavations and works for the provision of services, works would commence on the construction of the development. The pouring of concrete foundations would be supervised at all times.

Site Reinstatement and Landscaping

Landscaping works will take place at the proposed site would include the removal of any hardcore surfaces, removal of any stockpiled material from excavations, the removal of construction plant, equipment and signage, the reseeding/replanting of exposed soil where required and the planting of trees and shrubs. Reinstatement and landscaping activities would also include the removal of silt control features, once there is no risk to the River Barrow.

2.4.3 Construction Working Hours

It is anticipated that construction works would be undertaken during standard construction hours, as follows:

Start	Finish	Days
8am	6pm	Monday – Friday
8am	2pm	Saturday

No works would take place on Sundays or Bank Holidays. It should be noted that there may be times where it is necessary to undertake construction works outside of the times mentioned above, for example concrete pours. In such cases, notification would be given where necessary to the relevant bodies (i.e. local council) and any potentially effected local residents in good time and prior to specified works commencing.

2.4.4 Construction Plant and Equipment

The construction plant and equipment likely to be used during the construction phase of the project are included in the table below. It should be noted that this list is not exhaustive.

Table 2.6: Likely Construction Plant and Equipment Required

ACTIVITY	POSSIBLE PLANT / EQUIPMENT REQUIRED
Site Clearance and Excavations	Excavator Dumper trucks Bulldozer Graders Rollers
Construction of Building	Tracked Excavator JCB Site Dumper Cement Mixer Crane Piling
Site Reinstatement and Landscaping	Tracked Excavator Site Dumper Bulldozer

2.4.5 Security Arrangements

The construction works contractor would ensure the proposed development site is secured, so as to provide the safety of all potentially affected parties, including staff, contractors, traffic and pedestrians. Only authorised personnel would be allowed onto the development site. The site would be secured by a fence, hoarding or another suitable site barrier system to protect against unauthorised entry. The construction works contractor would implement the appropriate security arrangements, including signing in / out procedures, signage and out-of-hours security.

2.4.6 Health and Safety

All activities undertaken at the proposed development site during the construction phase shall be in accordance with the requirements of the Safety, Health and Welfare at Work Act 2005, as amended, and the Safety, Health and Welfare at Work (Construction) Regulations, 2013. As required by the 2013 regulations, a Health and Safety Plan would be prepared by the construction works contractor, which would address health and safety issues from the design stages through to the completion of construction works. This plan would be updated and reviewed as required as the proposed development progresses.

Prior to works commencing onsite, all site personnel, including sub-contractors, would receive induction training that would incorporate health and safety requirements and good practice. Site induction would be mandatory for all employees, sub-contractors and visitors to the development site. Specific training would be provided, where necessary.

All construction personnel, contractors and visitors to the site would wear the following appropriate Personnel Protective Equipment as a minimum at all times:

- Safety helmet;
- Hi-visibility clothing (coat or vest);
- Safety boots;
- Eye protection where identified for specific activities.

Regular site safety audits would be undertaken throughout the construction phase to ensure the rules and regulations established for the site are complied with at all times.

2.4.7 Construction Signage and Labelling

Environmental signage and labelling would be used to inform site personnel of environmental requirements and restrictions with regards construction activities, in addition to promoting environmental good practice at the development site. The construction works contractor would erect the appropriate signage and label all relevant areas and receptacles. Examples would include designated storage areas for potentially polluting materials and waste and site environmental rules.

2.4.8 Construction Method Statement

Prior to works commencing, the construction works contractor would prepare and provide to the clients a detailed Construction Method Statement, which would address all construction works required for the proposed development. The construction works contractor would maintain a register of all method statements for the project, in addition to a register of all site personnel trained on the method statements.

2.4.9 Potential for Historic Contamination

As per the O'Callaghan Moran & Associates soil assessment of the site from samples collected by IGSL Ltd the site contains contaminated material. If additional contaminated material is encountered during construction works, appropriate measures would be undertaken in compliance with relevant waste legislation, and as outlined in Section 5.7 below. The relevant authorities would be notified where required.

3 ENVIRONMENTAL MANAGEMENT

3.1 ENVIRONMENTAL MANAGEMENT SYSTEMS

An Environmental Management System (EMS) would be put in place by the construction contractor. The EMS would take into account any comments or recommendations received by Carlow County Council and, in accordance with the relevant guidelines, would be appropriate to the scale of the operation.

The construction works contractor would implement a number of environmental management procedures, including but not limited to the following:

- Awareness and Training;
- Environmental Emergency Response;
- Record Keeping, Auditing and Monitoring;
- Environmental Complaints Procedure;
- Protection of Flora and Fauna;
- Protection of Soil, Groundwater and Surface Water Quality;
- Chemical and Hazardous Material Management;
- Noise Management;
- Dust Management;
- Waste Management.

The CEMP would be updated as necessary to ensure that all measures detailed within the environmental management procedures have been addressed within the CEMP.

3.2 ROLES AND RESPONSIBILITIES

The construction works contractor (CWC) would put an experienced construction management team in place. The Project Manager would have overall responsibility for environmental management at the proposed development site. The indicative roles and responsibilities for the relevant site personnel are detailed below.

Project Manager

The Project Manager's responsibilities are as follows:

- Management of the project;
- Implementing the Construction Environmental Management Plan;
- Monitoring the performance of the CEMP and maintaining records to demonstrate compliance with the CEMP and Construction Method Statement;
- Updating the Construction Environmental Management Plan as required;

- Ensuring no deterioration of the environment occurs as a result of the project;
- Co-ordinating the construction team;
- Implementing the Health and Safety Plan and associated responsibilities;
- Production of construction programmes;
- Maintaining of relevant records and registers;
- Ensuring site personnel receive induction and are provided with the relevant information relating to the protection of the environment during works;
- Dealing with any queries or complaints from the public.
- Maintaining a project diary.

Quality Manager

The Quality Manager would report to the Project Manager. Their responsibilities are as follows:

- Implementing the Construction Environmental Management Plan;
- Management of quality issues relating to the project;
- Co-ordinating the construction teams;
- Ensuring that method statements are in place;
- Implementing the Health and Safety Plan.

Site Engineer

The Site Engineer would report to the Project Manager. Their responsibilities are as follows:

- Ensuring that all aspects of the project comply with the Construction Environmental Management Plan;
- Materials procurement;
- Design of Temporary Works;
- Administration;
- Programming and planning;
- Implementing the Health and Safety Plan;
- Maintaining a project diary.

EHS Officer

The EHS Officer would report to the Project Manager. Their responsibilities are as follows:

- Ensuring the Health and Safety Plan is implemented;

- Ensuring the Construction Environmental Management Plan is being implemented and followed at all times;
- Updating the Construction Environmental Management Plan as required;
- Ensuring all personnel have received safety inductions;
- Investigating any accidents, incidents or near misses;
- Ensuring relevant personnel have received training in environmental issues;
- Undertaking site audits on a regular basis.

All Staff and Sub-contractors

All site personnel and sub-contractors have the following responsibilities:

- Ensuring the requirements of the Construction Environmental Management Plan are followed;
- Co-operate with the Project Manager and EHS Officer in the implementation and development of the CEMP;
- Co-operate as required with site inspections and audits;
- Report all incidents, accidents and near misses to the Project Manager and/or EHS Officer.

3.3 REGULATIONS AND REQUIREMENTS

3.3.1 Legislative Context

The following list of acts and regulations, which is not exhaustive, would be complied with by the construction works contractor throughout the proposed project:

- The Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000;
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) and (Amendment) Regulations, 2015 (S.I. No. 355 of 2015), transposing the Habitats Directive 92/43/EEC (as amended) and Birds Directive 2009/147/EC;
- The Flora (Protection) Order, 2015 (S.I. No. 356 of 2015);
- Planning and Development Regulations, 2001 to 2018;
- The Local Government (Water Pollution) Act, 1977, as amended;
- The Fisheries (Consolidation) Act, 1959, as amended;
- Fisheries (Amendment) Act, 1999;
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);

- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) and 2016 (S.I. No. 366 of 2016);
- Air Pollution Act, 1987;
- Air Quality Standards Regulations, 2011 (S.I. No. 180 of 2011), transposing the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC);
- Planning and Development Act 2000 (S.I. No. 30 of 2000), as amended;
- The EPA Act (Noise) Regulations 1994 (S.I. No. 179 of 1994);
- European Communities (Construction Plant and Equipment) Permissible Noise Levels Regulations, 1988 (S.I. No. 320 of 1988), as amended;
- European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001 (S.I. No. 632 of 2001);
- Council Directive 1999/31/EC on the Landfilling of Waste and Council Directive 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills;
- Waste Framework Directive 2008/98/EC;
- WEEE Directive 2012/19/EU;
- Waste Management Act 1996 as amended;
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. 163 of 1998) and (Amendment) Regulations 2000 (S.I. 73 of 2000);
- Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (WEEE) (S.I. 149 of 2014);
- Litter Pollution Act 1997 and Litter Pollution Regulations 1999 (S.I. 359 of 1999);
- Waste Management (Prohibition of Waste Disposal by Burning) Regulations 2009 (S.I. 286 of 2009), as amended;
- European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011), (Amendment) Regulations 2016 (S.I. 315 of 2016), and European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. 223 of 2015), European Union (Waste Directive) (Recovery Operations) Regulations 2016 (S.I. 372 of 2016).

3.3.2 Relevant Guidelines

The following list guidance documents, which is not exhaustive, would be consulted as relevant by the construction works contractor throughout the proposed project:

- *Environmental Good Practice on Site* (CIRIA, 2015);
- *Control of Water Pollution from Construction Sites; guidance for consultants and contractors* (CIRIA, 2001);
- *Control of Water Pollution from Construction Sites – Guide to Good Practice* (CIRIA, 2002);

- *Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters* (IFI, 2016);
- *The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (National Roads Authority (NRA), 2010);
- *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (NRA, 2006a);
- *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (NRA, 2006b);
- *Guidelines for the Treatment of Bats during the Construction of National Road Schemes* (NRA, 2006c);
- *Bat Mitigation Guidelines for Ireland* (Kelleher and Marnell, 2006);
- *Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland, 2010);
- *Assessment of dust from demolition and construction 2014* (Institute of Air Quality Management, 2014);
- *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (NRA, 2004);
- *Code of practice for noise and vibration control on construction and open sites* (British Standard 5228-1, 2009);
- *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, 2006);
- *Southern Region Waste Management Plan 2015-2021 and Associated Reports*.

3.4 ENVIRONMENTAL AWARENESS AND TRAINING

Prior to works commencing onsite, this CEMP and its contents would be communicated to all site personnel, including sub-contractors, as part of induction training. Site induction would be mandatory for all employees, sub-contractors and visitors to the development site.

Specific training would be provided, where necessary, to nominated personnel to address any incidents or emergencies that could have a potential to cause environmental pollution. This training would be provided to staff via toolbox talks, and may address issues such as the following:

- Water Pollution;
- Spill Control;
- Noise Pollution;
- Dust Pollution;
- Waste Management.

3.5 DOCUMENT REVIEW AND UPDATES

To ensure the CEMP remains "fit for purpose", it would be reviewed and updated as necessary throughout the construction phase to ensure that it continues to facilitate efficient and effective delivery of the project environmental commitments for the protection of the environment.

The CEMP would be reviewed to address, for example, the following;

- Any recommendations, comments or observations received by Carlow County Council following the submission of the CEMP for approval;
- Any requirements or issues highlighted by prescribed bodies such as Inland Fisheries Ireland and the NPWS;
- To ensure it reflects best practice at the time of construction;
- To ensure it incorporates findings from previous inspections and audits undertaken by the construction works contractor;
- To ensure it incorporates findings and/or recommendations arising from the site meetings between the construction works contractor and clients.

The Project Manager and EHS Officer would be responsible for the review of the CEMP and would ensure that any revisions to the CEMP are effectively communicated as appropriate to onsite personnel and sub-contractors.

3.6 ENVIRONMENTAL COMMITMENTS

The clients recognise that construction works have the potential to adversely impact upon the environment and would therefore ensure that the construction works contractor is committed to the effective implementation of the CEMP. Compliance with the CEMP, including all procedures, work practices and controls, would be mandatory by all personnel and sub-contractors employed during the construction phase. The CEMP outlines the necessary control measures that are required to avoid, minimise or mitigate potential effects on the environment.

The construction works contractor would be committed to the implementation of the controls / mitigation measures specified within the following sections:

- Dust Management – Section 5.1;
- Surface Water, Groundwater and Soil Contamination Control – Section 5.2;
- Terrestrial Biodiversity Protection Protocol – Section 5.3;
- Invasive Species Control – Section 5.4;
- Noise and Vibration Control – Section 5.5;
- Traffic Control – Section 5.6;
- Waste Management Control – Section 5.7;
- Chemicals and Hazardous Materials Management – Section 5.8.

The Project Manager, Quality Manager and EHS Officer would be responsible for the implementation of the CEMP throughout construction works. The Project Manager would be responsible for monitoring the performance of the CEMP and maintaining records to demonstrate compliance with the CEMP and would be assisted by the EHS Officer.

3.7 COORDINATION WITH EXTERNAL ENTITIES

In the event of an environmental incident at the site, the construction works contractor would follow the Emergency Management Plan as appropriate. The construction works contractor would liaise with the relevant third parties as appropriate, which may include the following:

- Emergency Services;
- Carlow County Council;
- National Parks and Wildlife Service;
- Inland Fisheries Ireland;
- Environmental Protection Agency

4. ENVIRONMENTAL IMPACTS

4.1 AIR QUALITY IMPACTS

Generally, the primary potential air quality impact or nuisance associated with construction activities is dust. Excavations and earth moving operations may generate quantities of construction dust, particularly in drier weather conditions. The extent of any construction dust generation depends on the nature of the construction dust (soils, sands, gravels, silts etc.) and the construction activity. The potential for construction dust dispersion depends on the local meteorological conditions such as rainfall, wind speed and wind direction.

Particulate Matter (PM10 and PM2.5) is measured at Carlow Town Air Monitoring Site approximately 412m north east of the proposed development and has a Current Index: 1 (Good). The proposed development is located in the Air Zone C (Other Cities and Large Towns) and has a current Air Quality Index status of "2-Good".

The issue of construction dust dispersion may be exaggerated with vehicles transporting sand/gravels/concrete/etc. to and from the site, having the potential to cause an environmental nuisance to use of the local road.

Dust is normally defined as particulate matter in the size range of 1 - 75µm in diameter, with particles less than 1µm being classified as smoke or fumes. Particles greater than 10µm are associated with public perception and nuisance. Dusts are normally present in the atmosphere at varying levels of concentration and can have a wide variety of man-made and natural origins including:

- Products of combustion from e.g. fires, power stations and motor vehicles;
- Mechanical handling of minerals and allied materials;
- Industrial activities.

Dust particles are dispersed by their suspension and entrainment in airflow. Dispersal is affected by the particle size, shape and density, as well as wind speed and other climatic effects. Smaller dust particles remain airborne for longer, dispersing widely and depositing more slowly over a wider area.

The main potential sources of air borne dust from construction activities are as follows:

- Construction vehicles, construction traffic and haulage routes;
- Excavation works and earth-moving activities;
- Materials (particularly excavated soils) handling, storage and stockpiling.

Construction dust control is a common part of construction management practices. The effect of construction activities on air quality, in particular construction dust, would not be significant following the implementation of standard working practices and the proposed mitigation measures outlined in Section 5.1.

4.2 SURFACE WATER, GROUNDWATER AND SOIL IMPACTS

During construction works, the main potential impacts upon surface water quality, groundwater quality and soils would be the release of suspended solids during soil disturbance works and the release of potentially polluting substances, such as hydrocarbons (fuels and oils) and uncured concrete.

Suspended solids could become entrained in surface water run-off and could affect aquatic habitats through deposition. An increase in sediments has the potential to impact upon fish 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 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. Aquatic flora and fauna could also be impacted upon by an increase in nutrients which are bound to suspended solids. A significant increase in nutrients can result in excessive eutrophication, leading to deoxygenation of waters and subsequent asphyxia of aquatic species.

Another potential source of contamination to surface water quality during construction works would be the potential release of uncured concrete. In the event of uncured concrete entering surface water, the pH would be altered locally, potentially causing an adverse impact upon aquatic flora and fauna and causing an alteration to the waterbody substrate.

As the site is at the banks of the River Barrow the potential for construction works to impact upon surface water quality would be greatly reduced if guidelines and regulations where strictly adhered to.

A potential source of chemical contamination would be from the release of hydrocarbons from construction plant and equipment. Hydrocarbons can affect water quality, potentially resulting in toxic and / or de-oxygenating conditions for aquatic flora and fauna. Pollution could occur in a number of ways, such as neglected spillages, the storage handling and transfer of oil and chemicals and refuelling of vehicles.

With regards the stripping of soils and subsoils at the development site, excavated subsoils and soils would be reused in the reinstatement process where possible. Therefore, there would be no significant impact upon soils due to excavation activities. Specialist machinery would be used during construction works to minimise the potential compaction of soils and subsoils.

Control measures would be put in place to ensure that no deterioration in the River Barrow arises as a result of the construction of the proposed development.

4.3 TERRESTRIAL BIODIVERSITY IMPACTS

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

The construction phase of the development would not result in a direct and permanent loss of any habitat of significance. The main development site will see the loss of amenity grassland (GA2) and scattered trees and park (WD5) habitats. With the car park area to cover amenity

grassland (GA2), recolonising bare ground (ED3) and scrub (WS1) habitats. These habitats would be considered as having been modified and of low ecological value. Therefore, the loss of this habitat would not be considered significant.

The construction phase of the development would not result in a direct and permanent loss of ecologically valuable habitats. The majority of the flora found within the site are ornamental and recolonising species and are not of conservation status or of high ecological value.

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

Construction work has the potential to disturb fauna due to the generation of construction noise. However, construction noise would not be considered to pose a significant risk to fauna owing to the small scale of the proposed development, the transient nature of works and given that all vehicles where possible would be equipped with mufflers to suppress noise, as is standard practice. Where possible, no construction works would be conducted outside of normal working hours, therefore there would be no disturbance to nocturnal species.

During construction works, there is potential for invasive species to be introduced to the site through the movement of materials, such as soil and stone, and the arrival of construction plant and equipment from an area with invasive species. Materials containing invasive species such as Japanese Knotweed (*Fallopia japonica*) or Himalayan Balsam (*Impatiens glandulifera*) 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 (S.I. No. 477 of 2011), it is a legal requirement to obtain a license to move "vector materials" listed in the Third Schedule, Part 3. Under Regulation 49(2) of the aforementioned regulations, it is an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow in any place any plant which is included in Part 1 of the Third Schedule.

Artificial lighting has the potential to negatively impact upon nocturnal species, particularly bat species, as illumination can impact upon their roosting sites, commuting routes and foraging areas. While some bat species, such as Leisler's bats (*Nyctalus leisleri*), may take advantage of prey concentrating around light sources, other bat species are sensitive to lighting and will avoid artificially lit up areas. Measures, as outlined in Section 5.3, would therefore be implemented by the construction works contractor to reduce the potential impact of light pollution.

The potential impacts of construction works upon aquatic flora and fauna due to a potential deterioration in water quality are discussed in Section 4.2 above.

4.4 NOISE IMPACTS

Construction noise, while inherently noisy and disruptive, is temporary in duration. It is anticipated that the construction of the proposed development would take approximately eighteen months to complete. The works involving heavy machinery for the purposes of excavation, the preparation of building foundations and passing construction traffic usually cause the most disturbances to nearby residents.

Generally, the type of works involved at this development site would include the following:

- Excavation/Levelling: Excavator, dump truck & dozer.
- Foundations: Excavations, cement mixers & concrete vibrators and piling.
- General Construction: Masonry construction, services, drainage and surfacing etc.

There are currently no published Irish guidance documents relating to permissible noise levels that may be generated during the construction phase of a project. However, the National Road Authority (NRA) has published the document "*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*", 2004. This document provides a useful reference for assessing construction noise of the proposed development. The NRA considers that the noise levels provided in the table below are typically deemed acceptable.

Table 4.1: NRA Acceptable Noise Levels

Days / Times	$L_{Aeq\ (1hr)}$ dB	$L_{pA\ (max)slow}$ dB
Monday to Friday (07:00 to 19:00hrs)	70	80
Monday to Friday (07:00 to 22:00hrs)	60	65
Saturday (08:00 to 16:30hrs)	65	75
Sundays and Bank Holidays (08:00 to 16:30hrs)	60	65

4.5 TRAFFIC IMPACTS

Accessed to the site is from Barrow Street which connects to Maryborough Street. The R430 is approximately 160m to the south of the Barrow Street intersection with Maryborough Street. The N80 national road is 1.5km via Castlecomer Road and 1.3km via Chapel Street. The N80 connects with the M9 motorway approximately 9km to the southeast.

Construction works have the potential to impact upon traffic volumes in the area, which may subsequently impact upon the generation of noise and dust emissions.

Traffic impacts may arise via the following:

- Delivery of construction plant and equipment to the site;
- Delivery of raw materials to the site;
- Vehicle movements from staff, sub-contractors and site visitors travelling to and from the site;

- Vehicle movements associated with waste removal at the site.

4.6 WASTE MANAGEMENT IMPACTS

It is anticipated that the following categories of waste may be generated during the construction of the project:

Table 4.2: Categories of Waste Generated During Construction

WASTE TYPE	EWC CODE	ORIGIN
Concrete	17 01 01	Waste concrete may arise due to surplus concrete from pouring activities.
Wood	17 02 01	Wood waste may arise during construction works, including building and shuttering works, due to damaged / defected wood, off-cuts and surplus wood.
Glass	17 02 02	Glass waste may arise due to damaged / defected glass and accidental breakages.
Plastic	17 02 03	Plastic waste may arise due to damaged / defected products.
Metals (including alloys)	17 04 01 - 07	Waste metal may arise due to damaged / defected metal, off-cuts and surplus metal.
Soils and Stones	17 05 04	Excavated soils and stones waste would arise during site excavations and earth-moving activities.
Insulation materials and asbestos containing construction materials	17 06	Waste may arise due to damaged / defected insulation panels and off-cuts.
Biodegradable waste	20 02 01	Green waste would arise during site clearance works, with the removal of existing vegetation at the site.

Other waste materials which may arise during construction works in small volumes include:

- Waste Oils and Liquid Fuels – EWC 13 02 and EWC 13 07;
- Waste from Electrical and Electronic Equipment – EWC 16 02;
- Cables – EWC 17 04 11;
- Paints – EWC 20 01 28;
- Wood Preservatives – EWC 03 02;
- Batteries – EWC 16 06.

Wastes from EWC fractions EWC 03 02, EWC 13 02, EWC 13 07, EWC 16 02 and EWC 16 06 may be hazardous.

Throughout the construction phase, wastes generated would be managed by the construction works contractor in order of priority in accordance with Section 21A of the Waste Management Act 1996, as amended, as per the waste hierarchy below.

Figure 4.1: The Waste Hierarchy

5. ENVIRONMENTAL MITIGATION MEASURES

5.1 DUST MANAGEMENT

The following dust control measures would be implemented by the construction works contractor for the duration of the construction of the proposed development:

- Cognisance would be taken of the guidelines published by the Institute of Air Quality Management (IAQM), "*Assessment of dust from demolition and construction 2014*";
- Material handling systems and site stockpiling of materials would be designed and laid out to minimise exposure to wind;
- Prolonged storage of materials onsite would be avoided;
- When transporting materials to and from the site, vehicles would be fitted with covers where possible to prevent material loss;
- Public roads outside the site would be regularly inspected for cleanliness and cleaned as necessary. A road sweeper would be used if required;
- While the natural recolonization of exposed areas of soil during reinstatement activities is preferred, re-seeding would be undertaken where required to promote the rapid stabilisation of soils;
- Regular visual inspections would be undertaken around the proposed site boundary to monitor the effectiveness of dust control measures.

Should additional dust control measures be required, for instance during particularly dry weather, dust suppression measures would be undertaken, including the following:

- Water misting plant, such as bowsers and sprays would be used as required and where necessary;
- Where practicable, stockpiles of excavated soils and exposed surfaces would be dampened down via misting plant.

5.2 SURFACE WATER, GROUNDWATER AND SOIL CONTAMINATION CONTROL

The implementation of control measures for dust and materials storage and handling would reduce the potential for a deterioration in water quality. These measures are outlined in Sections 5.1 above and 5.8 below. The following control measures shall be implemented by the construction works contractor for the protection of surface water quality and groundwater quality:

- The construction works contractor would adhere to standard construction best practice, taking cognisance of the Construction Industry Research and Information Association (CIRIA) guidelines "*Control of Water Pollution from Construction Sites; guidance for consultants and contractors*" 2001 and "*Control of Water Pollution from Construction Sites – Guide to Good Practice*", 2002;

- Cognisance would be taken of the 2016 guidelines published by Inland Fisheries Ireland, "*Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*";
- Daily visual inspections would be undertaken of the site access road to ensure no silt-laden surface water runoff leaves the site, with the potential to either join with any adjacent surface water drainage systems within the vicinity or travel to along the road network to the road network to the River Barrow;
- Where spoil is generated, this would only be stored temporarily. A designated spoil area would be established by the construction works contractor within site footprint at the site. Where possible, spoil would be covered or alternatively, graded to avoid ponding or water saturation;
- Manhole covers and stormwater gullies will be protected by silt blankets/mats;
- Silt fencing (comprising of a porous filter fabric which detains sediment, or other similar methods) would be provided along the site boundary with the River Barrow. Silt fencing would remain in place until the completion of construction works;
- Additional sandbags should be placed along Bachelors Walk to prevent any material going into the River Barrow;
- Silt control features would be inspected on a daily basis and maintained as appropriate;
- 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;
- Works at the flood defence wall should only be carried out when there is no risk of flood waters;
- 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;
- All construction plant machinery and equipment would be maintained in good working order and regularly inspected;
- A designated area for the storage of hydrocarbons would be established by the construction works contractor and inspected on a regular basis;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be readily available onsite;
- The construction works contractor would ensure the relevant site personnel are trained in spillage control;
- In the unlikely event of a suspected deterioration in water quality within the River Barrow, due to construction works at the development site, works would immediately cease, an investigation into the cause undertaken and the relevant NPWS and Inland Fisheries Ireland personnel informed.

Additional controls to reduce the potential impact upon soils include the following:

- Specialist machinery (such as tracked machinery) would be used to minimise the potential compaction of soils;
- Excavated materials would be stockpiled onsite, segregated into topsoil and subsoils, and reused in reinstatement activities where possible;
- Any fill and aggregate material required onsite would be sourced from reputable, local quarries.

5.3 BIODIVERSITY PROTECTION PROTOCOL

It is considered that the implementation of the controls and measures outlined in Sections 5.1 – 5.8 would reduce any potential adverse impacts upon the biodiversity in the area. The following control measures are also recommended to ensure that the proposed construction works would not have any significant impact upon biodiversity:

- All construction works would be confined as far as possible to the development footprint;
- Where possible, no construction works would be conducted outside of normal working hours, to reduce potential noise disturbance to nocturnal species;
- Should a protected fauna species such as Bat species or Otter (*Lutra lutra*) be found during the construction works, an officer of the NPWS would be notified prior to the resumption of construction works;
- Where possible, any vegetation removal works would be scheduled outside of the 1st of March to the 31st of August period, so as not to disturb nesting bird species;

Construction works have the potential to impact upon bat species due to lighting disturbance on commuting and foraging habitat. Therefore, the following measures would be implemented by the construction works contractor:

- Construction works in the hours of darkness, when bats are active (April – October), would be kept to a minimum;
- Should lighting be required during construction works, it would be of a low height (without compromising safe working conditions) to ensure minimal light spill. Where possible and where practicable to do so, timers or motion sensors would be used;
- Directional lighting would be used where possible, by use of louvres or shields fitted to the lighting;
- White light emitting diode (LED) would be used where possible, which is considered to be a low impact in comparison to other lighting types.

5.4 INVASIVE SPECIES CONTROL

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

- Regular site inspections would be undertaken to ensure that no growth of invasive species has taken place;
- All relevant construction personnel would be trained in invasive flora species (main species of concern) identification and control measures;
- If found an invasive species of flora is found growing at the site then an invasive species management plan must be put in place such as *Best Practice Management Guidelines on Himalayan Balsam* (Kelly, Maguire, and Cosgrove, 2008);
- The construction works contractor would ensure that all equipment and plant is inspected for the presence of invasive species and thoroughly washed prior to arriving to, and leaving from, the development site;
- In the event of an invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 appearing onsite, works within the immediate vicinity would cease until the invasive plant has been appropriately treated and disposed of to a suitably licenced facility, in accordance with Regulation 49 of the 2011 Regulations;
- Only suitably licenced and trained personnel should use herbicides, following guidelines and instructions on correct use;
- Herbicides should not be used in or adjacent to watercourses unless application is targeted in the control of invasive species such as giant hogweed (*Heracleum mantegazzianum*).
- Cognisance would be taken of National Roads Authority's Guidelines on "*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*".

5.5 NOISE AND VIBRATION CONTROL

The following noise control measures would be implemented by the construction works contractor for the duration of the construction of the proposed development:

- Cognisance would be taken of the National Roads Authority's "*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*", the British Standard 5228: Part 1 "*Code of practice for Noise Control on Construction and Open Sites*" and the CIRIA 2015 "*Environmental Good Practice on Site*";
- Plant and machinery used on-site would comply with the EC (Construction Plant and Equipment) Permissible Noise Levels Regulations, 1988 (S.I. No. 320 of 1988). All noise producing equipment would comply with S.I. No 632 of 2001 European Communities (Noise Emission by Equipment for Use Outdoors) Regulations 2001;
- All construction activities would take place between 8:00am and 7:00pm, Monday to Friday, and 8:00am to 2:00pm on Saturdays. Any works which, by necessity, are

required to be carried out outside of these times would be notified to the relevant bodies and any potentially effected local residents in good time and prior to specified works commencing;

- No plant used on site would be permitted to cause an ongoing public nuisance due to noise;
- Where required, screens or barriers would be installed to shield particularly noisy activities;
- Deliveries would be organised to arrive during daytime hours (between 8:00am and 7:00pm, Monday to Friday, and 8:00am to 2:00pm on Saturdays);
- Care would be taken when unloading vehicles to minimise noise disturbance. Materials should be lowered, not dropped, insofar as practicable and safe;
- Regular maintenance would be carried out on all construction equipment, machinery and vehicles;
- Construction plant would be operated in accordance with the operator's instructions;
- Engine and machinery covers would be maintained in good working order and would remain closed whenever machinery is in use;
- Where practicable, all mechanical plant would be fitted with effective exhaust silences and pneumatic tools fitted with mufflers or silencers;
- Any compressors required would be silenced or of sound reduced models fitted with acoustic enclosures;
- Construction plant would be selected, where possible, with low inherent potential for the generation of noise;
- Construction plant would be switched off or throttled back to a minimum when not in use;
- Staff personnel would be instructed to avoid unnecessary revving of machinery;
- Site personnel would notify the Project Manager in the event equipment or plant becomes defective, resulting in high noise emissions. Any defective plant would be kept out of service until the necessary repairs are undertaken.

5.6 TRAFFIC CONTROL

The construction works contractor would undertake site entrance works to facilitate the access of traffic associated with the proposed development. The construction works contractor would ensure the following:

- Deliveries to the site would be via suitably contained vehicles, with sheeting and covers where required;
- Deliveries to the site would be scheduled during the construction hours of 8:00am to 7:00pm Monday to Friday, and 8:00am to 2:00pm on Saturdays;
- Deliveries and removals would be coordinated and scheduled to the site to avoid congestion on Maryborough Street and Barrow Street;

- Where possible, large-scale vehicle movements would be timed outside peak hours on the local road network.
- The contractor shall provide for the safe passage of pedestrian and vehicular traffic and measures to keep the impact of the works on local roads, and local communities to a minimum;
- Local roads would be inspected and cleaned as necessary to ensure that access roads are kept clear of mud and debris;
- Advise haulage contractors on the appropriate routes to and from the site and to adhere to good traffic management principles;
- Materials would not be delivered to the site until required.

5.7 WASTE MANAGEMENT CONTROL

5.7.1 Waste Storage Area

A designated waste storage area located away from the River Barrow, would be established by the construction works contractor. Suitable waste receptacles / skips would be provided by the appointed waste contractor(s) during the construction phase, with skips / bins allocated to specific waste streams to avoid contamination. The number and size of waste receptacles / skips would be determined following the appointment of the waste contractor(s). Waste receptacles would be appropriately labelled.

Where waste fuels and oils are generated, they would be stored within a bunded container within the designated waste storage area. Any hazardous materials would be stored separately from non-hazardous waste, and would be stored within bunded containers / upon a bund where appropriate.

The removal of waste from the site would be undertaken on a regular basis, preventing large volumes of waste accumulating onsite.

5.7.2 Waste Contractors

The collection of wastes from the site would be undertaken by suitably authorised waste hauliers, and would only be recycled / recovered or disposed of at suitably licenced waste facilities.

The construction works contractor would appoint a waste contractor(s) for the construction phase. The waste contractor(s) appointed for the project would have experience in construction waste management and would be appropriately licenced, holding the relevant waste collection permit and/or waste licences for the types of waste anticipated to be generated during construction works.
The waste contractor(s) would be appropriately licenced in compliance with the following regulations:

- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007);

- Waste Management (Collection Permit) Amendment Regulations 2008 (S.I. No. 87 of 2008);
- Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007);
- Waste Management (Facility Permit and Regulations) Amendment Regulations 2008 (S.I. No. 86 of 2008).

The construction works contractor would ensure that copies of all waste contractors' collection permits and licences would be available for inspection, as discussed in the "Record Keeping" section below.

5.7.3 Waste Minimisation

Waste minimisation and prevention would be the responsibilities of the construction works contractor, who would ensure the following:

- The efficient ordering and purchasing of materials to reduce surplus materials;
- Materials would be ordered in appropriate sequence to minimise materials stored on site;
- The correct storage of materials to minimise the generation of damaged materials, for example keeping materials packaged until they are ready to be used and storing materials which are vulnerable to water damage via precipitation under cover and raised above the ground;
- The handling of materials with care, to avoid undue damage;
- The return of uncured concrete to the batching plant where possible;
- The re-use of shutters for concrete works;
- Where possible, excavated subsoil and topsoil would be reused for the reinstatement of the development site.

The construction works contractor would reuse materials onsite where possible. In particular, inert wastes (such as concrete (EWC 17 01 01), bricks (EWC 17 01 02) and soils and stones (EWC 17 05 04)) would be used for infilling activities where suitable (and where required).

5.7.4 Management of Waste Streams

As mentioned in Section 4.6 above, wastes generated would be managed by the construction works contractor in order of priority in accordance with Section 21A of the Waste Management Act 1996, as amended.

Excavated Soils and Stones:
O'Callaghan Moran & Associates (OCM) undertook a waste characterisation assessment of samples from the of made ground and natural soils collected by IGSL Ltd. (Document Ref: 23016). The samples were tested for Total Heavy Metals, Total Organic Carbon (TOC), BTEX (benzene, toluene, ethylbenzene and xylene) aliphatic and aromatic hydrocarbons, Polychlorinated Biphenyls (PCB), Mineral Oil, Polyaromatic Hydrocarbons (PAH) and asbestos. Leachate generated from the samples was tested for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium and zinc, chloride, fluoride, soluble sulphate, phenols, dissolved organic carbon (DOC), total dissolved solids (TDS). See report for detailed analysis of samples and results from Bore Holes (BH) 1-3 and Trial Pits (TP) 1-5.

Samples from BH1 (1.0m and 2.0m), BH3 (1.0m), TP1 (1.0m), TP2 (1.0m and 2.0m), TP4 (1.0m), TP5 (0.5m and 1.5m) meet the inert WAC they do not meet the soil recovery criteria for PAHs. The samples have been classified as B-1 suitable for recovery/disposal to inert waste landfill with increased limits. The samples from BH1 (1.0m) and BH3 (1.0m) meet the inert Waste Acceptance Criteria (WAC) but do not meet the soil recovery criteria for metal concentrations. Both samples exceed the 1.5 times trigger level for Copper. The samples have been classified as B-1 suitable for recovery/disposal to inert waste landfill with increased limits. See OCM report for waste management options.

Soils and stones arising from excavations would be reused in the reinstatement where possible. This would be investigated by the construction works contractor and would be subject to appropriate testing to ensure the material is suitable for its proposed end use.

Any excess excavated soils would be collected by a licenced waste contractor and either reused for reinstatement activities at other sites if suitable or disposed of as appropriate. Alternatively, the construction works contractor would investigate if excavated soils can be classified as a by-product under Article 27 of the Waste Directive Regulations, 2011. If a local use for the material is identified, and if the proposed end use meets the requirements of the Article 27 regulations, there would be no requirement to send this material to a waste facility.

In the event of any evidence of additional soil contamination being found during work on site, the appropriate remediation measures would be employed. Areas of potentially contaminated soil would be isolated and tested for contamination in accordance with the 2002 Landfill Directive (2003/33/EC). Any work of this nature would be carried out in consultation with, and with the approval of, the EPA and the Environmental Department of Carlow County Council. Pending the results of laboratory testing, this material would be excavated and exported off-site, by an appropriately Permitted Waste Contractor holding an appropriate Waste Collection permit for this hazardous material, and would be sent for appropriate treatment / disposal to an appropriately Permitted / Licenced Waste Facility.

Concrete, Bricks, Tiles and Ceramics:
Surplus concrete would be returned to the batching plant where possible. Where concrete, blocks and bricks arise from construction activities, they would be crushed and used for ground-fill material where deemed suitable (should infill activities be required). Where these materials cannot be reused onsite, they would be diverted for recycling if possible.

Wood:
Waste wood would be reused for shuttering where suitable. Wood that is uncontaminated (free from preservatives and paints) would be segregated and recycled. Any wood not deemed suitable for recycling would be disposed of as appropriate.

Metal:
Metal is highly recyclable and has a considerable rebate value. Where metal cannot be reused onsite, the majority would be recycled.

Other Recyclables:
These include plastic, cardboard and paper. Where possible, the different recyclables would be segregated onsite and sent for recycling. With regards packaging waste, the construction works contractor would investigate the possibility of returning the packaging to the supplier.

Mixed Municipal Waste and Other Non-Recyclable Waste:
Wastes not suitable for reuse or recycling would be stored in separate waste receptacles. Prior to removal from site, the construction works contractor would inspect the receptacles / skips to ensure they contain no recyclable material or materials which can be reused.

Glass:
Small volumes of waste glass may be generated during the construction phase. As glass can contaminate other segregated waste streams, it would be collected separately where possible. The majority of glass would be recycled.

Green Waste:
Green waste may be sent for composting if not possible to reuse onsite during landscaping / re-instatement activities, or for disposal as deemed appropriate by the waste contractor.

Hazardous Materials:
Hazardous waste would be managed in accordance with the Waste Management (Hazardous Waste) Regulations 1998 and 2000. Small quantities of hazardous waste may be generated onsite. Examples of potentially hazardous wastes include fuels and oils, batteries, paints, adhesives and sealants. Hazardous waste would be stored separately from non-hazardous waste, would be appropriately labelled and would be stored upon bunds where appropriate. The construction works contractor would ensure that the appointed waste contractor is licenced to transport / accept hazardous waste prior to the waste leaving the site. Depending on the type of hazardous material, the waste may be recovered, recycled or disposed of appropriately.

Waste Electrical and Electronic Equipment (WEEE):
This waste, if generated, would be stored separately from other waste streams and would be covered pending collection. WEEE can contain hazardous components such as batteries. All hazardous wastes would be stored in appropriate secure bunded containers prior to removal from site. Some hazardous wastes may not be stored with other wastes. This would be determined by the contractor and appropriate precautions taken.

5.7.5 Records

For each waste movement and for each type of waste, the construction works contractor would obtain a signed waste docket from the waste contractor, detailing the weight, type of material, destination of material and whether the material is going for recycling, recovery or disposal. The construction works contractor would retain copies of the waste contractors' relevant waste collection permits and waste licences on file throughout the construction phase.

5.8 CHEMICAL AND HAZARDOUS MATERIALS MANAGEMENT

5.8.1 Concrete

The following controls would be implemented throughout the construction phase:

- The use of pre-cast concrete where possible;
- The delivery and pouring of concrete would be supervised at all times;
- The pouring of concrete would be avoided during 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.

5.8.2 Hydrocarbons

The following controls for the handling and storage of hydrocarbons would be implemented throughout the construction phase:

- All construction plant machinery and equipment would be maintained in good working order and regularly inspected;
- Any fuels, oils or chemicals would be stored in accordance with the EPA guidance on the storage of materials, in a designated bunded area, with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers;
- A designated area for the storage of hydrocarbons would be established by the construction works contractor and inspected on a regular basis;
- Deliveries of fuels and oils to the site would be supervised;
- Fuels / oils would be handled and stored with care to avoid spillage or leakage;
- Where appropriate, small construction plant equipment would be placed on drip trays;
- Any waste fuel / oils would be collected in bunded containers at the designated waste area and properly disposed of to an authorised waste contractor;
- 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;
- The construction works contractor would ensure the relevant site personnel are trained in spillage control;
- Where construction plant shows signs of hydrocarbon leakage, site personnel would cease the operation of the item in plant in question and notify the Project Manager. Any defective plant would be kept out of service until the necessary repairs are undertaken.

5.8.3 Excavated Materials

This section should be read in conjunction with the dust control measures relating to the storage and handling of spoil outlined in Section 5.1. The following controls for the handling and storage of excavated materials would be implemented throughout the construction phase:

- Spoil would only be stored at the proposed development site temporarily. A designated spoil area would be established by the construction works contractor away from the River Barrow and drainage system within Carlow Town Park.
- Spoil would be covered or alternatively, graded, to avoid ponding and water saturation, in addition to minimising exposure to wind;
- Where required, silt fencing would be placed around spoil areas until such time as the excavated soil has been used in re-instatement works or removed offsite by a licenced waste contractor;
- Spoil would be used in the reinstatement process where possible;
- Reinstatement would be undertaken as soon as possible after excavation and earth-moving works.

5.9 EMERGENCY MANAGEMENT PLAN

An Emergency Response Plan would be prepared for the proposed development by the construction works contractor, which would cover all potential risks, including environmental risks, such as fire, explosion, accidents, spillage and leaks. Designated site personnel would be trained as first aiders and fire marshals, with additional site personnel trained in environmental emergencies such as spill response procedures.

6. MONITORING AND AUDITING

6.1 REPORTING AND RECORD KEEPING

The Project Manager, in conjunction with the EHS Officer, would ensure that appropriate, detailed records are maintained during the construction phase of the development. Records of all works associated with the proposed development would be completed by the construction works contractor throughout the construction phase. Environmental records would include waste and site inspection records and where relevant, environmental incident and complaints records. Other records may include Safety Data Sheet records and a copy of the Safety File. Where relevant to the associated works, statutory inspection records would be maintained for such activities as excavations and lifting gear.

Where necessary and as requested by the local authority, copies of relevant construction activity records can be made available.

In the event of an environmental incident occurring at the site with the potential to cause environmental pollution, the Project Manager would notify the clients and the relevant third parties, as outlined in Section 3.7, as soon as practicable. Such environmental incidents may include:

- Fire;
- Water pollution event;
- Hydrocarbon or chemical spill;
- Excessive noise;
- Excessive dust.

Any complaints and/or incidents would be reported to the Project Manager. The Project Manager would be responsible for developing and maintaining a register of complaints and a register of incidents, with details on follow-up actions. The Project Manager would notify the clients as soon as practicable of any environmental complaint or incident.

6.2 ENVIRONMENTAL PERFORMANCE MONITORING

6.2.1 Safety Monitoring

The EHS Officer would be present at the development site during working hours, to ensure activities are undertaken in a safe manner.

6.2.2 Environmental Monitoring

The EHS Officer would be present at the development site during working hours, to ensure activities are undertaken in an environmentally sensitive manner. The EHS Officer would undertake regular site inspections and audits, at least weekly, to monitor the environmental performance of the site and address any potential environmental issues such as dust, litter and noise. Site inspections and audits would include the following:

- Assessment of public access roads;
- Assessment of neighbouring properties;
- Chemical and hydrocarbon storage area;
- Waste storage area;
- Spoil area.

The EHS Officer would be responsible for maintaining a register of all environmental monitoring and would communicate the site's environmental performance during site meetings.

6.3 MONITORING COMPLIANCE REPORTS

As noted in Section 6.2 above, site inspections and audits would be undertaken by the EHS Officer on a regular basis, at least weekly. These site inspections and audits would monitor the environmental performance of the site.

Where works are determined to be in breach of any specifications outlined within the CEMP, the EHS Officer shall notify the Project Manager, who would raise a non-compliance report and notify the clients as soon as practicable. Non-compliance reports may also be raised as a result of an incident or potential incident, the receipt of a complaint or as a result of a regulatory inspection or audit.

The non-compliance report would include details on the nature of the non-compliance, the proposed corrective action required, action taken to prevent recurrence and verification that the corrective actions have been undertaken and the non-compliance has been closed out. Any non-compliances would be discussed at the fortnightly meetings between the construction works contractor and clients.

6.4 PROCEDURES TO REVIEW INSPECTIONS AND STEPS TO ADDRESS NON-COMPLIANCE

The Project Manager would be responsible for reviewing inspections, audits and any arising non-compliances. A review schedule would be decided upon between the construction contractors and the clients upon the approval of the CEMP by Carlow County Council.

The Project Manager would notify the clients as soon as practicable of any non-compliances arising during the construction of the proposed development. The Project Manager would be responsible for notifying the relevant third parties where required of non-compliances at the site and would liaise with third parties as necessary as to the outcome of the non-compliance. All non-compliances would be investigated immediately, and the construction works contractor would aim to close out non-compliances as soon as possible. As discussed in Section 6.3, the statuses of any non-compliances would be discussed at the fortnightly meetings between the construction works contractor and clients.

Where it has been determined that revisions to the CEMP are required to ensure recurrence of a non-compliance does not take place, the Project Manager and EHS Officer would make the necessary changes to the CEMP and would ensure that the revisions are effectively communicated as appropriate to onsite personnel and sub-contractors.

7. CONCLUSION

This CEMP has been prepared to demonstrate the commitment of the clients to environmental management at the proposed development site, and outlines the work practices and control measures that would be implemented by the construction works contractor throughout the construction period to ensure that potential environmental impacts are effectively managed, reduced or eliminated.

The CEMP is considered a "live" document and would be reviewed and updated as appropriate upon approval by Carlow County Council and as necessary as construction works progress.

8. REFERENCES

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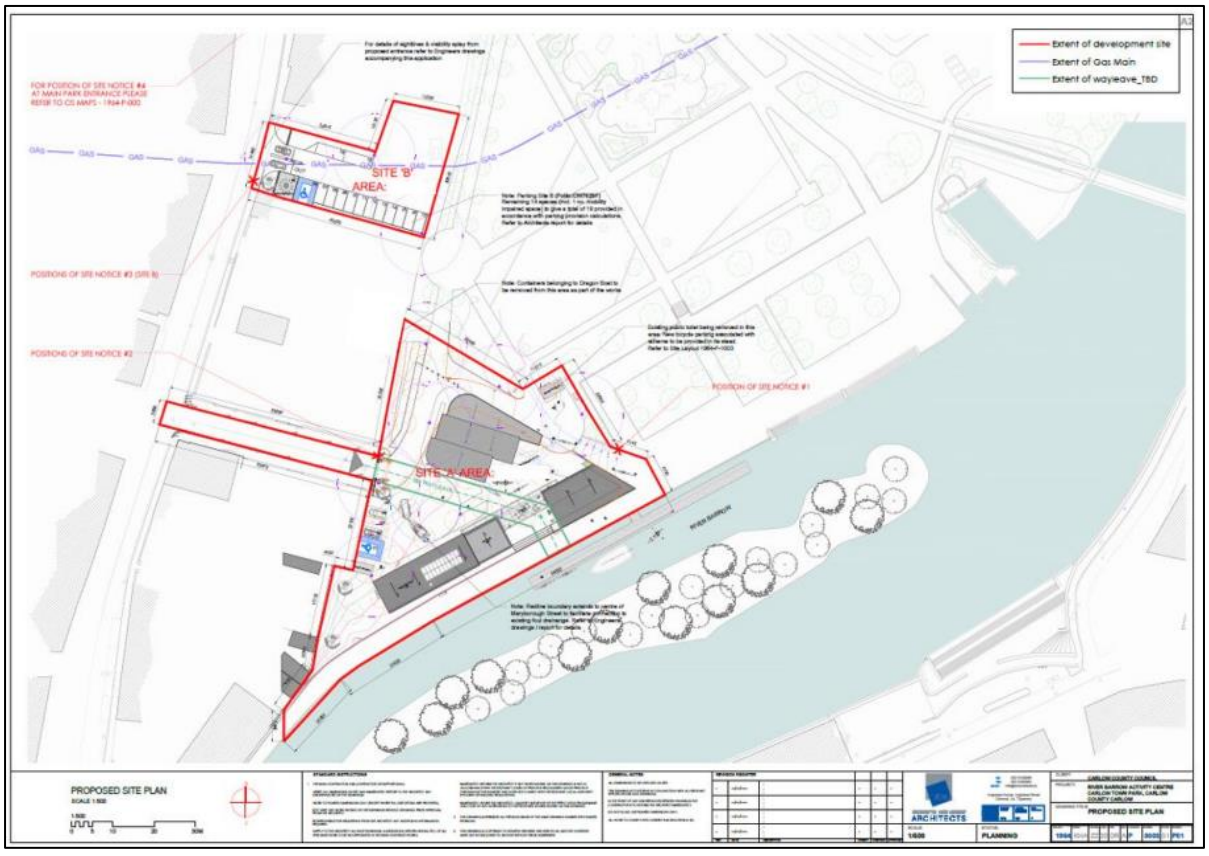
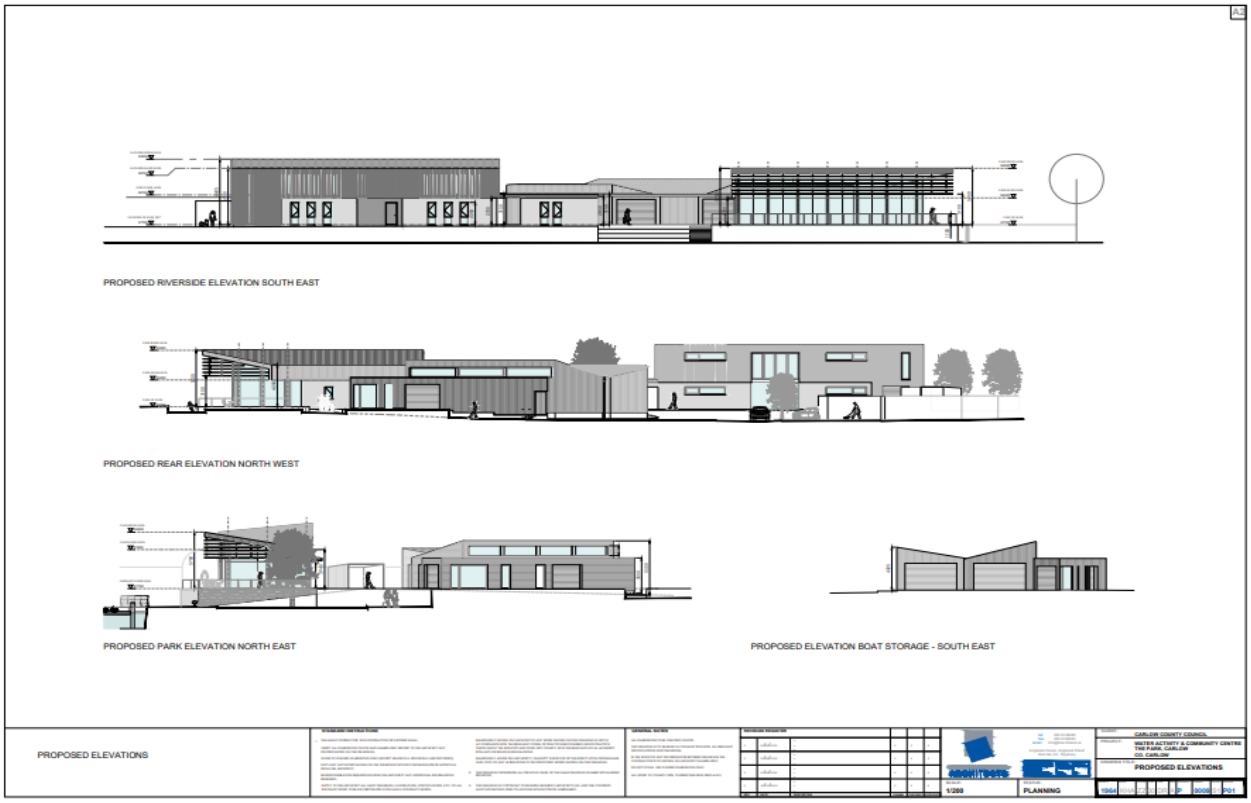
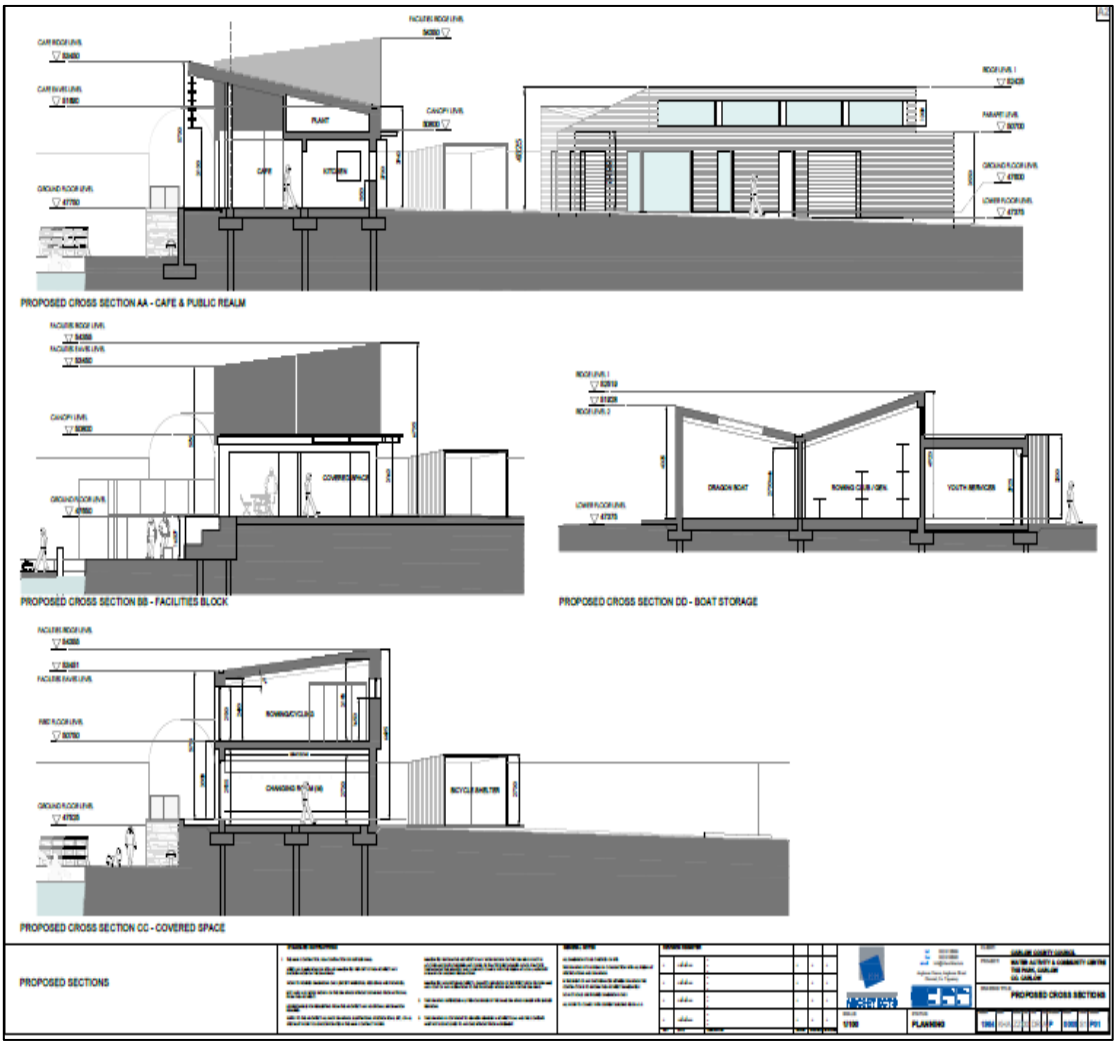
APPENDIX A

PROPOSED DEVELOPMENT LAYOUT


AREA SCHEDULE
Barrow Street
To be demolished
Foul Drainage
Storm Drainage
Finished Floor Level
Proposed Floor Area
Proposed Constuction
PROPOSED GROUND FLOOR PLAN
PROPOSED GROUND FLOOR PLAN


Extent of development site
Extent of Gas Main
Extent of wayleave_TBD
SITE 'B' AREA:
SITE 'A' AREA:
PROPOSED SITE PLAN
PROPOSED SITE PLAN


PROPOSED RIVERSIDE ELEVATION SOUTH EAST
PROPOSED REAR ELEVATION NORTH WEST
PROPOSED PARK ELEVATION NORTH EAST
PROPOSED ELEVATION BOAT STORAGE - SOUTH EAST
PROPOSED ELEVATIONS
PLANNING


PROPOSED CROSS SECTION AA - CAFE & PUBLIC REALM
PROPOSED CROSS SECTION BB - FACILITIES BLOCK
PROPOSED CROSS SECTION DD - BOAT STORAGE
PROPOSED CROSS SECTION CC - COVERED SPACE
PROPOSED SECTIONS
PLANNING