

AtkinsRéalis



Natura Impact Statement - Volume 1 (Main Text)

Uisce Éireann

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Mortarstown Wastewater Treatment Plant Upgrade

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1. Introduction

AtkinsRéalais was commissioned by Uisce Éireann (UÉ) to prepare, on its behalf, a Natura Impact Statement (NIS) in respect of the proposed upgrades to the Mortarstown Wastewater Treatment Plant and Kilkenny Road Wastewater Pumping Station (“the proposed development”) in Carlow Town. The proposed development comprises upgrades to the existing wastewater treatment plant (WwTP) at Mortarstown and replacement of the existing wastewater pumping station (WwPS) at Kilkenny Road with a new WwPS adjacent to the WwTP at Mortarstown, including a new gravity sewer from the existing WwPS to the new one. A more detailed description is provided in Section 2 below. The proposed development is not directly connected with or necessary to the management of any designated site for nature conservation.

This document comprises the NIS in respect of the proposed development and is intended to assist the competent authority by providing it with sufficient evidence to make an informed assessment, pursuant to Article 6(3) of the Habitats Directive (92/43/EEC), of the implications of the proposed development for the integrity of Natura 2000 sites, in view of their conservation objectives.

2. Description of the Proposed Development

2.1 Nature and Extent of the Proposed Development

The development will consist of the upgrade the existing Mortarstown WwTP, construction of a new inlet pump station at the treatment plant site, construction of a new microtunnel gravity sewer along Kilkenny Road, between the existing Kilkenny Road Pumping Station and the new inlet pump station, landscaping, boundary treatments, and all ancillary site works. This includes the associated internal roads, lighting, security fencing and landscaping.

The current WwTP access from Green Road will be retained. A new internal vehicle access point will be provided to facilitate entry to the rear of the UÉ-owned property situated to the west of the WwTP boundary. The current Kilkenny Road Pumping Station access will also be retained.

The proposed WwTP upgrade works will be developed to the west of the existing plant footprint, taking in areas of agricultural land and part of the adjoining UÉ property.

The proposal also includes the demolition of the inlet works, the stormwater holding tank, the sludge cake transfer facility, and 2 no. small chambers as well as decommissioning of the Kilkenny Road WwPS, final clarifiers (2 no.) and 2 no. rising mains. In addition, the existing outfall pipe will be replaced with a new outfall pipeline. The existing WwTP site is ca. 3.79 hectares (ha) and after completion of the upgrade works the Site will expand to ca. 5.53ha. The total Proposed Development site area (Red line boundary) is ca. 10.766 ha in size, as presented in Figure 2-1 below.



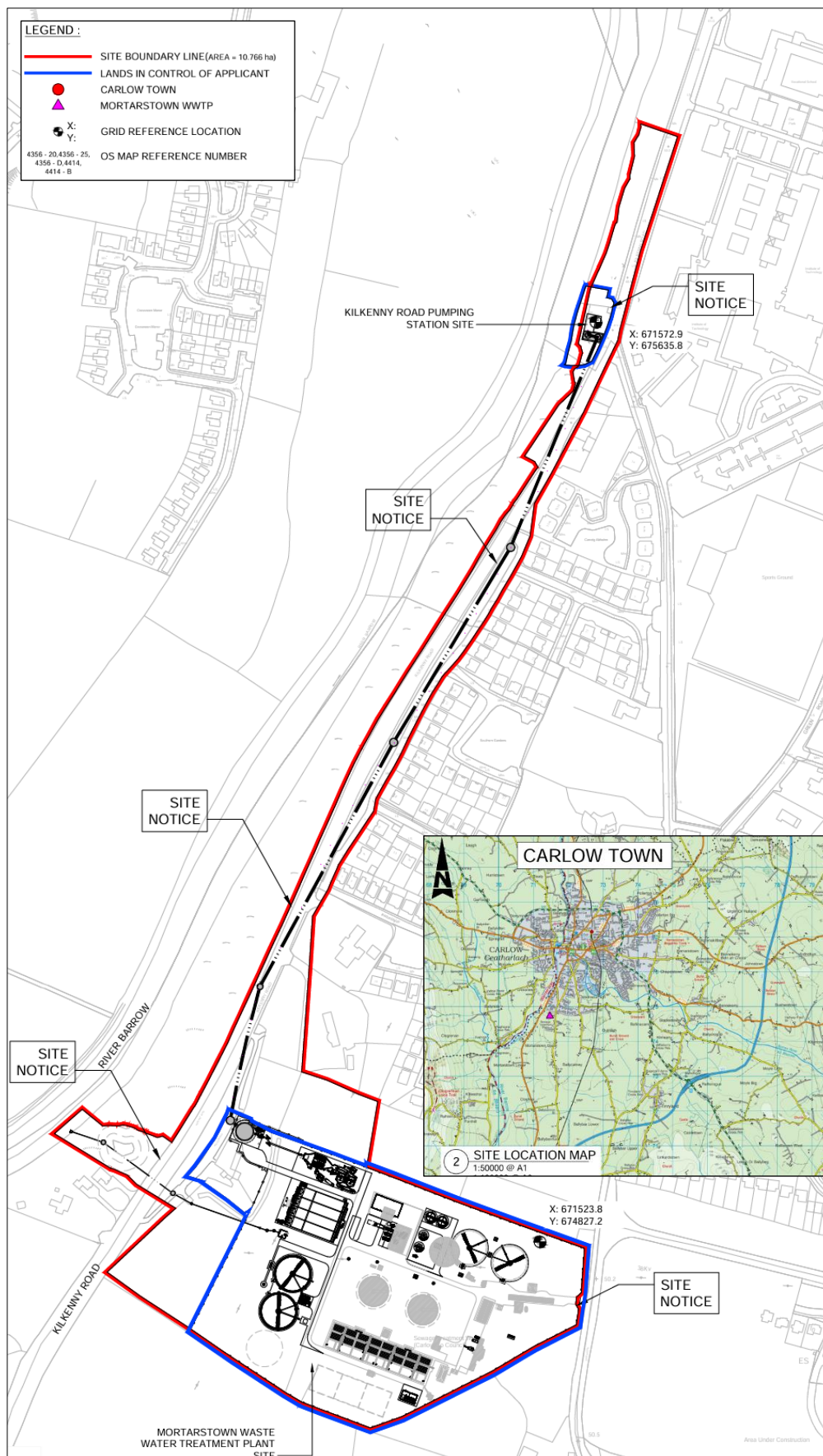


Figure 2-1 - Layout of Proposed Works (including redline boundary).

A summary of the works required is provided in the following sections. The layout of the proposed development and process diagram is presented in Figure 2-5 to Figure 2-11.

The proposed hydraulic loadings for the agglomeration are presented in Table 2-1. To enable ease of future expansion, some elements of the works (primarily civil works) are sized to cater for additional future loading.

Table 2-1 - Proposed Hydraulic Loading Rates (2037)

Parameter	Unit	Hydraulic Loads
Design population served	capita	58,500
Dry Weather Flow Rate QDWF	m ³ /hr	370
Full Flow to Treatment QFFT	m ³ /hr	1,110
Peak Flow (Formula A)	m ³ /hr	3,800

2.1.1 Microtunnel Gravity Sewer

A 785m long microtunnel gravity sewer (Ø1650mm internal diameter) will be constructed from the south side of Kilkenny Road Pumping Station to the wet well of the new inlet pump station adjacent to the new inlet works of the existing WwTP which is proposed to be upgraded. The microtunnel will be routed under the R448 Kilkenny Road before it traverses under a treelined verge and local access road (to UÉ owned property) to connect to the WwTP.

Figure 2-5 to Figure 2-7 illustrates the proposed microtunnel route and associated long sections.

2.1.2 Inlet Pump Station

2.1.2.1 New Inlet Pump Station (PS)

The construction of the new inlet pump station at the Mortarstown WwTP site, located west of the WwTP and north of a vacant cottage, will involve:

- The provision of 1 no. terminal pump station.
- The provision of 4 no. raw sewerage pumps inclusive of Mechanical, Electrical, Instrumentation, Control, and Automation (MEICA) works.
- The provision of 1 no. odour control unit.
- The provision of 1 no. flow meter chamber.

The new pump station will be designed for 4 no. pumps configured on a duty/assist/assist/standby basis to deliver a future 2037 design horizon Formula A flow of 1,055 l/s (3,800 m³/h). Each pump will be rated to deliver 389 l/s (1,400m³/hr) so that 3 no. pumps configured on a duty/assist/standby basis will service the current Formula A flow of 695 l/s (2,503m³/hr).

The size of the pumps dictate that the proposed pump station will be configured as a wet well/dry type pump station. Given that the new pump station at Mortarstown WwTP will also be utilised as the main launch shaft of the microtunnel gravity sewer, a circular structure is proposed.

The circular well is designed based on a 15m diameter circular concrete chamber with a dividing wall and 6m segment for the wet well and an 8.6m segment for the dry well. Refer to Figure 2-8 for the proposed layout of the new pump station at Mortarstown WwTP.



2.1.2.2 Existing Kilkenny Road Pumping Station (PS)

The existing Kilkenny Road pumping station will be decommissioned. The existing building structure will remain. The existing above ground steel gantry structure, access stairs and pumps will be removed from site and repurposed. Incoming flows will be diverted via the existing below-ground holding tank to a newly constructed manhole positioned south of the existing PS, conveying flows to the new gravity microtunnel. Existing overflows at the Kilkenny Road PS will be retained in accordance with the current Wastewater Discharge Licence (EPA WwDL Ref: D0028-01) and utilised in extreme events where the new gravity microtunnel may be at maximum capacity.



Figure 2-2 – View of existing Kilkenny Road Pump Station (Photograph from AtkinsRéalis site visit)

2.1.3 Mortarstown WwTP

The upgrade of the Mortarstown Wastewater treatment plant will require:

- Provision of a new foul pumping station for local agglomeration adjacent to existing inlet works (supplemented by the WwTP standby generator).
- Provision of new fuel storage tank (5000l) and standby diesel generator to service the WWTP (roofed).
- Provision of new inlet works to include fine screening, mechanically raked by-pass screen, screening compaction and conveyance to skips, grit removal, grit classification and conveyance to skips. The new inlet works will be provided with an odour treatment unit.
- Provision of 2 no. new stormwater storage tanks and 2 no. new stormwater return pumps.
- Existing final settlement tanks and associated Return Activated Sludge (RAS)/ Waste Activated Sludge (WAS) to be retained, cleaned and decommissioned.
- Provision of 4 no. new primary settlement tanks and scraper systems.
- Provision of 4 no. new primary sludge pumps.
- Provision of a new scum pump.



- Provision of 4 no. new air blowers and modifications to existing air delivery pipework
- Provision of a new air blower building (13.6m x 8.6m, roofed) and repurposing of existing blower building for storage purposes.
- Provision of new fine bubble diffused air system in existing aeration tanks.
- Provision of 2 no. new final settlement tanks with half-bridge scrapers.
- Provision of a new RAS/WAS pumping station and station fitted with 2 no. RAS pumps and 2 no. WAS pumps.
- Structural refurbishment of the existing picket fence tanks.
- Mechanical and electrical refurbishment of existing picket fence thickener and conversion of second existing tank to a sludge blending tank.
- Provision of 2 no. additional picket fence thickener tanks.
- Provision of 1 no. belt press, polymer prep unit and polymer dosing pumps in the existing sludge dewatering building.
- Provision of a new pumped sludge transfer system between the sludge blending tank and picket fence thickeners.
- Provision of upgrades to the existing sludge import facility.
- Provision of minimum 6 no. new odour control units
- Provision of upgrade to existing chemical storage tank and dosing facility
- Provision of 1 no. new outfall chamber and outfall pipe.
- Modifications to existing administration building.
- Provision of MEICA and SCADA upgrades.
- New storage shed and associated gantry (24.9m x 12.7m, roofed).
- Demolition of existing inlet works structure.
- Existing utility service relocations.
- General civil site works.
- Future storm tank (not part of this planning consent).
- Future aeration tank (not part of this planning consent).
- Future final settlement tank (not part of this planning consent).
- Provision for PV solar panels,
- Diversion of existing ESB 38kv HV overhead lines and 10kV/20kV MV line on site (carried out by ESB).

Preliminary aerial photographs / 3D Visualisations showing the existing and proposed layout of Mortarstown WwTP site are presented in Figure 2-3 and Figure 2-4 respectively. It should be noted that these graphics do not include the final planting design. For the proposed Site Landscaping Layout drawings (Sheet 1 to Sheet 5) refer to Drawing Ref: 5161805_EWE_DR_MOR_5180 to Drawing Ref: 5161805_EWE_DR_MOR_5184, submitted as part of this planning application.

Refer also to Figure 2-9 for the proposed layout of the WwTP.





Figure 2-3 - 3D Visualisation of the existing Mortarstown WwTP site



Figure 2-4 - 3D Visualisation of the proposed Mortarstown WwTP development site¹

¹ It should be noted that these graphics do not include the final planting design. For the proposed Site Landscaping Layout drawings (Sheet 1 to Sheet 5) refer to Drawing Ref: 5161805_EWE_DR_MOR_5180 to Drawing Ref: 5161805_EWE_DR_MOR_5184, submitted as part of this planning application.

2.1.3.1 Preliminary Treatment – Inlet Works

As part of the upgrade, the existing inlet treatment works will be decommissioned, demolished, and replaced with a newly constructed inlet works, designed to UÉ Standard IW-TEC-700-99-02. The new inlet works will be elevated to allow gravity flow and will include 4 no. fine screens, one mechanical bypass screen, and 2 no. grit removal units with pumps and a classifier. Wastewater from the new Inlet Pump Station (up to 4,100 m³/h) and the new local foul pump station (up to 300 m³/h) will discharge into a flow splitting chamber, monitored by flow meters. A standby generator will be installed to ensure continuous operation. Excess flows will overflow to new stormwater tanks, and Full Flow to Treatment (FFT) will be sampled at SP1. Screenings and grit will be washed and conveyed to enclosed skips for off-site disposal. Offensive odours will be managed using covered units and an air extraction system connected to a dedicated odour treatment facility. The inlet works is numbered as “04” on the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.2 Preliminary Treatment – Stormwater Storage

As part of the stormwater management upgrade, flows exceeding the FFT will overflow downstream of screening and grit removal units and be directed to a new stormwater storage tank system with a total effective capacity of 6,231 m³, equivalent to 2.95 hours of Formula A – FFT at 58,500PE. If a storm event exceeds this capacity, the screened and de-gritted wastewater will overflow to the WwTP outlet chamber and discharge via a licensed discharge location to the River Barrow (albeit the proposed design will result in improvement to the current situation by means of increased stormwater storage capacity, as described below).

The existing 1,560 m³ final settlement tanks will be repurposed as stormwater storage tanks and supplemented by 2 no. newly constructed tanks providing an additional 4,650 m³ of storage. If all tanks reach capacity, overflow will be recorded via a flow monitor. Once the storm subsides, stored water will be returned to the inlet works using a duty/standby pump set at 548 m³/h, initiated when inlet flow drops below 2 DWF (1,097 m³/h). The stormwater storage tanks are numbered as “05” on the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.3 Primary Settlement

As part of the new works, 4 no. rectangular horizontal-flow primary settlement tanks will be constructed to receive full flow to treatment (1,645 m³/h by 2052). These tanks will feature chain and flight scrapers for sludge collection, with a surface loading rate of 1.25 m/h when all tanks are in service, and will achieve 30% organics and 60% solids removal efficiency. Even with one tank offline, the loading rate will remain below 1.65 m³/m²/h at FFT. Progressive cavity or rotary lobe pumps (12.5 m³/h capacity) will transfer 3%DS sludge to the sludge blending tank, operating around 12 hours daily. The tanks will be covered, with access for maintenance and inspection, and equipped with sludge scrapers, scum skimmers, and a dedicated odour control system to manage emissions. The primary settlement tanks are numbered as “08” on the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.4 Secondary Treatment – Biological

The existing A2O biological process will be retained, as it is suitably sized for the projected 58,500 PE loading. This process biologically removes nitrogen and phosphorus through anaerobic, anoxic, and aerobic stages. New flowmeters and modulating penstocks will be installed to control flow to each anaerobic reactor. The system will utilize high-strength Influent from a local microbrewery as a carbon source, eliminating the need for external dosing. Upgrade works include replacing the existing chemical storage tank, installing new dosing pumps and lines, and replacing fine bubble air diffusers. 4 no. new 70 kW variable speed air blowers will be provided, housed in a new blower building with space for future expansion and maintenance access. Air will be distributed via a common main with automated control systems. Return Activated Sludge will be recycled at controlled rates to support biological treatment. The anaerobic reactors will be equipped with mixers to prevent solids settlement, and the anoxic reactors will receive variable internal recirculation flows. Mixed liquor will then pass to the aeration basins, which are split into two cells with fine bubble diffusers for efficient oxygen transfer. The existing aeration tanks are numbered as “09” on the drawing no. 5161805_EWE_DR_MOR_5101.



2.1.3.5 Secondary Treatment – Chemical

Phosphorus in wastewater exists as ortho-phosphate, polyphosphate, and organic phosphate. During aerobic treatment, polyphosphate and organic phosphate are converted to ortho-phosphate, which is the easiest to remove chemically. While most phosphorus will be removed biologically through the retained A2O process, chemical dosing will be applied at the aeration tank for simultaneous precipitation of residual phosphorus. This approach is optimal as it targets ortho-phosphate formed after biological treatment. The new chemical dosing system will be implemented in accordance with UÉ Standard IW-TEC-700-05. Upgrade works will include replacement of the existing chemical storage tank and installation of new dosing pumps and lines to support effective phosphorus removal. The upgraded chemical storage tanks are numbered as “39” on the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.6 Secondary Treatment – Final Settlement and Activated Sludge Pumping

Flows from the biological process will pass through the existing outlet chamber to a new flow splitting chamber upstream of secondary settlement. Secondary treatment will include 2 no. newly constructed 32m diameter radial flow settlement tanks, each equipped with full bridge scrapers and central sludge hoppers. These tanks are designed to treat flows up to 58,500 PE at peak mixed liquor concentrations of 3.4 kg/m³. Sludge will be returned to the biological process (RAS) at variable rates (0.75–2.5 DWF), while excess sludge (WAS) will be transferred to the sludge blending tank at 60 m³/h. Treated effluent will flow to a new Parshall flume fitted with an ultrasonic flow sensor and an autosampler for monitoring, before discharging, via a licensed discharge location to the River Barrow. A new pH/temperature sensor will also be installed. Final settlement will be supported by two new upward-flow tanks with a side wall depth of 3.9 m, designed for peak hydraulic loading of 39,488 m³/day. To mitigate the risk of rising sludge due to gas production from denitrification, a denitrification stage has been included in the process design to optimise carbonaceous biochemical oxygen demand (cBOD) removal and nitrogen reduction prior to settlement. The final settlement tanks and RAS/WAS pumping station are numbered as “13” and “18”, respectively in the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.7 Sludge Facility – Sludge Storage and Dewatering

The maximum solids production for the facility is estimated at 4,095 kgDS/day, comprising primary sludge (2,086 kgDS/day), secondary sludge (1,859 kgDS/day), and precipitant sludge (150 kgDS/day). The existing sludge import facility will be upgraded in accordance with IW-TEC-700-99-06 to accept sludge from local treatment plants, with an anticipated volume of 45 m³/day. Imported sludge will be screened and stored in a new underground tank, then pumped to the sludge blending tank, where all sludge streams will be combined to ensure a balanced and homogenous mixture. Blended sludge will be gravity thickened using the existing 6.0mØ picket fence thickener and 2 no. new 7.5mØ thickeners. In the picket fence thickeners, blended sludge will be thickened to approximately 2.5%DS.

Thickened sludge will be pumped directly to both the existing and the new belt press for dewatering to a cake concentration of 18-20%DS. Works will include the provision of 3 No. covered and forced-ventilated skips (6 changes per hour as a minimum). The skips will be suitable for holding the dewatered sludge contents allowing for 7 days storage. The skips will be suitable for collection by standard skip removal vehicles and will be designed for an operating life of 25 years. The skips will have an openable hatch on the roof to facilitate filling with the sludge conveyor and shall also have an integrated auger to allow for even distribution / filling without the need for moving the skip during the fill process. The skips will have a minimum volume capacity of 20m³ each. An internal stainless steel screw conveyor with a stainless-steel chute/hopper will transfer sludge from the sludge dewatering units and transport the cake outside the sludge press building into external sludge skips. The conveyor will be of minimum 300mm Ø with discharge height 2.5m, capable of delivering up to 400kgDS/hr of dewatered sludge to the sludge skips. Separate conveyors will be supplied for discharging into each of the 3 no. sludge skips.



Centrate and supernatant from thickening and dewatering will be returned to the biological process via the new pumping station, with a bypass to the import tank for maintenance. The system is designed to maintain consistent flow and prevent rising sludge issues in primary tanks. The sludge treatment units are numbered as “19”, “22”, “23”, “24”, and “25” in the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.8 Sludge Import

Future sludge imports are projected based on a 1.25% annual population increase, with volumes rising from 10,138 m³ currently to 13,830 m³ over 25 years. The existing site access and weighbridge will be retained, while the existing sludge import facility adjacent to the sludge dewatering building will be upgraded. This upgraded facility will include a packaged sludge reception plant with tanker coupling, grit drop-out box, and enclosed screening with washing and dewatering, mounted above an underground storage tank.

Screened sludge will be pumped to the sludge blending tank, which will be fitted with a mixer to homogenise imported and site-generated sludge. Homogenised sludge from the sludge blending tank shall have a dry solids concentration of approx. 0.85%DS and shall be pumped to the picket fence thickeners. Sludge will be dosed enroute with a polyelectrolyte principally to improve the quality of the supernatant and to aid in the entrapment of FOG and scum. Supernatant will be collected via submerged troughs and returned to the new liquor return pump station, which will feed back to the primary settlement tanks.

2.1.3.9 Administration Building

The existing administration building will be modified to include a larger control room. The proposed arrangement will facilitate the installation of new Form 4 control panels without compromising existing operations. All redundant panels will be removed from site and disposed of. The existing store will be repurposed to include a new office and laboratory. The administration building is numbered as “33” in the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.10 Final Effluent Monitoring

At the notch weir of the final settlement tanks, treated effluent overflows and passes by gravity through a flowmeter chamber and onto a sampling chamber from where a flow proportional sampler will collect samples. The flowmeter shall be installed with a bypass to facilitate servicing without interrupting plant flow. The sampling chamber shall be designed and constructed in accordance with IW-TEC-700-99-08 equipped with a pH monitor. The treated water flow meter is numbered as “14” in the drawing no. 5161805_EWE_DR_MOR_5101.

2.1.3.11 Hydraulic Design

Main Stream

Hydraulic design of the main process stream is constrained by the top water level in the biological process of 48.640 mOD. This level cannot be raised as an increase in level may dislodge the air header due to buoyancy effect. As such the treatment works are designed around this top water level. The key levels are as follows:

- Inlet Works 50.439 mOD (IL)
- Primary Settlement 49.730 mOD (TWL)
- Aeration Tank 48.640 mOD (TWL)
- Final Settlement 48.170 mOD (TWL)
- Combined Effluent Chamber 47.162 mOD (Operating Water Level)
- Flood level (1:100 year) 46.187 mOD (at outfall)



Stormwater Stream

Similar to the main process stream, the stormwater stream is constrained by the top water level in the existing final settlement tanks (repurposed stormwater tanks) of 47.700 mOD. All associated levels are designed to ensure that flows can be conveyed without adjusting this level. The key levels associated with the stormwater stream are as follows:

- Inlet Works 50.439 mOD
- New Storm Tank 48.659 mOD
- Existing Storm Tank 47.700 mOD
- Outfall Chamber 47.162 mOD
- Flood level 46.187 mOD

2.1.4 Outfall

The existing 600mm diameter (licenced) outfall pipe will be replaced with a new 900mm diameter gravity outfall pipe 250m in length. The new outfall pipe will be constructed to the south side of the existing outfall (ca. 10m from the existing licenced discharge point). The pipe will cross under the R448 by microtunnelling and enter the previously cleared woodland that is adjacent to the existing residential dwellings to the west of the Kilkenny Road. Location of the outfall is shown in Figure 2-10.

A temporary cofferdam / shoring will be required to construct the head wall on the riverbank. The temporary cofferdam installation (sheet pile driving) will be carried out from a barge operating on River Barrow. By this means, it is intended to avoid potential adverse effects of piling from the river bank due to the limited working area at the river bank.

The outfall pipe will enter the river ca. 1.5m below the low water level. Refer to Figure 2-9 for the location of both the existing and proposed outfall pipe. It should be noted that the existing outfall pipe will be retained; however will not be used as part of the proposed development.

The WwTP is designed to comply with the Emission Limit Values (ELV's) which have been calculated in a separate Waste Assimilative Capacity (WAC) Report (5161805DG0434 rev 5 - *Mortarstown WwTP - WAC Assessment Report*), presented in Appendix 12-3, Volume 3 of this EIAR. Results of the Emission Limit Values (ELV's) taken from the Waste Assimilative Capacity Report are presented in Table 2-2.

Table 2-2 - WwTP Design ELVs

Parameter	ELV (mg/l)
Ammonia	2.0 (in line with the current Discharge Licence)
BOD	25 (in line with UWWTD ²)
Ortho-P	1.0

2.1.5 Solar Energy Generation

UE's recent sustainability and renewable energy policies target generation of minimum 10% of plant's energy demand from renewable energy sources. The implementation of solar PV (Photovoltaic) panels is proposed on the grassed site to the west of the WwTP works (approximate dimensions of the solar array: 155m x 60m). A

² Urban Waste Water Treatment Directive



Renewable Energy Assessment Report has been prepared by AtkinsRéalis in 2025. The report concluded that a 382kW solar PV system can be installed within the available land. The proposed solar panels will provide 15% of the energy demand of the Mortarstown WwTP.

A Glint and Glare Assessment was undertaken by Macro Works Ltd in 2025 to determine the potential for solar reflectance effects upon dwellings and transport route receptors in respect of the proposed ground mounted solar element of the development at the Proposed Development. A copy of the Glint and Glare Assessment is presented in Appendix 6-3, Volume 3 of the EIAR.

2.1.6 Onsite Chemical and Fuel Storage

The chemical materials and fuels will be stored at site during the operational stage and their quantities are listed as follows:

- 2 no. Ferric Sulphate ($\text{Fe}_2(\text{SO}_4)_3$) tanks, 15,000l total (i.e. 2no. 7,500l tanks)
- 1 no. diesel fuel tank, 5,000l (Drawing Ref: 5161805_EWE_DR_MOR_5101)

The tanks are numbered as “39” and “31” respectively in the drawing no. 5161805_EWE_DR_MOR_5101.

- 3no. Polyelectrolyte 1,000l tanks, Intermediate bulk container (IBC tank), industrial-grade container used to store and transport liquids, to be stored in sludge building.

The polymer preparation unit including polyelectrolyte tanks are shown in the drawing no. 5161805_EWE_DR_MOR_5155.

All onsite chemical / fuel storage tanks will be suitably bunded.

2.1.7 Onsite Storage

A new storage shed (ca. 25m x 13m) will be constructed to the north of the sludge dewatering building as part of the proposed WwTP upgrade works. The shed will be used as the primary storage location of machinery and parts for the WwTP.

In addition, the disused blower building will be repurposed as additional storage facility for general materials and spares.



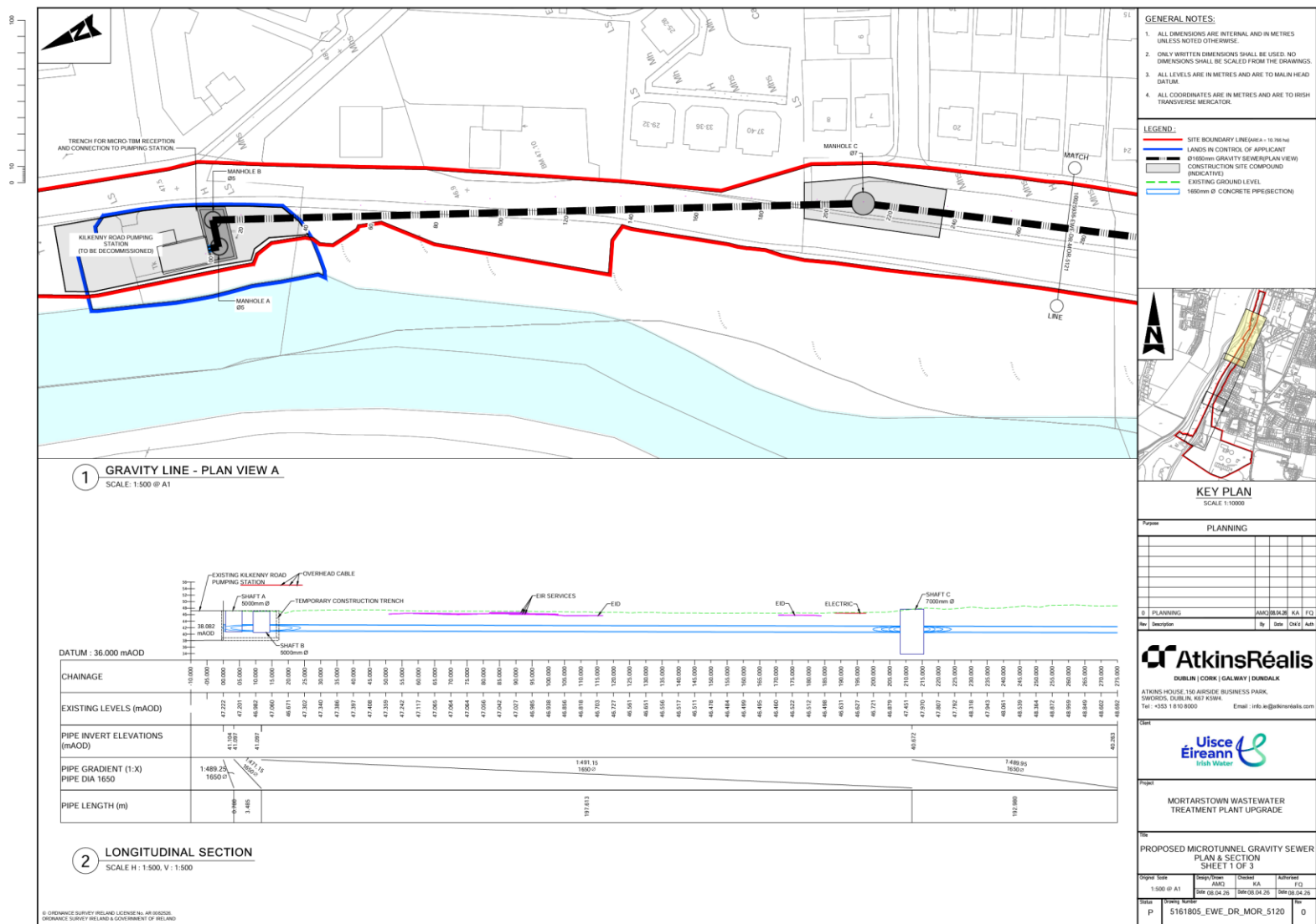
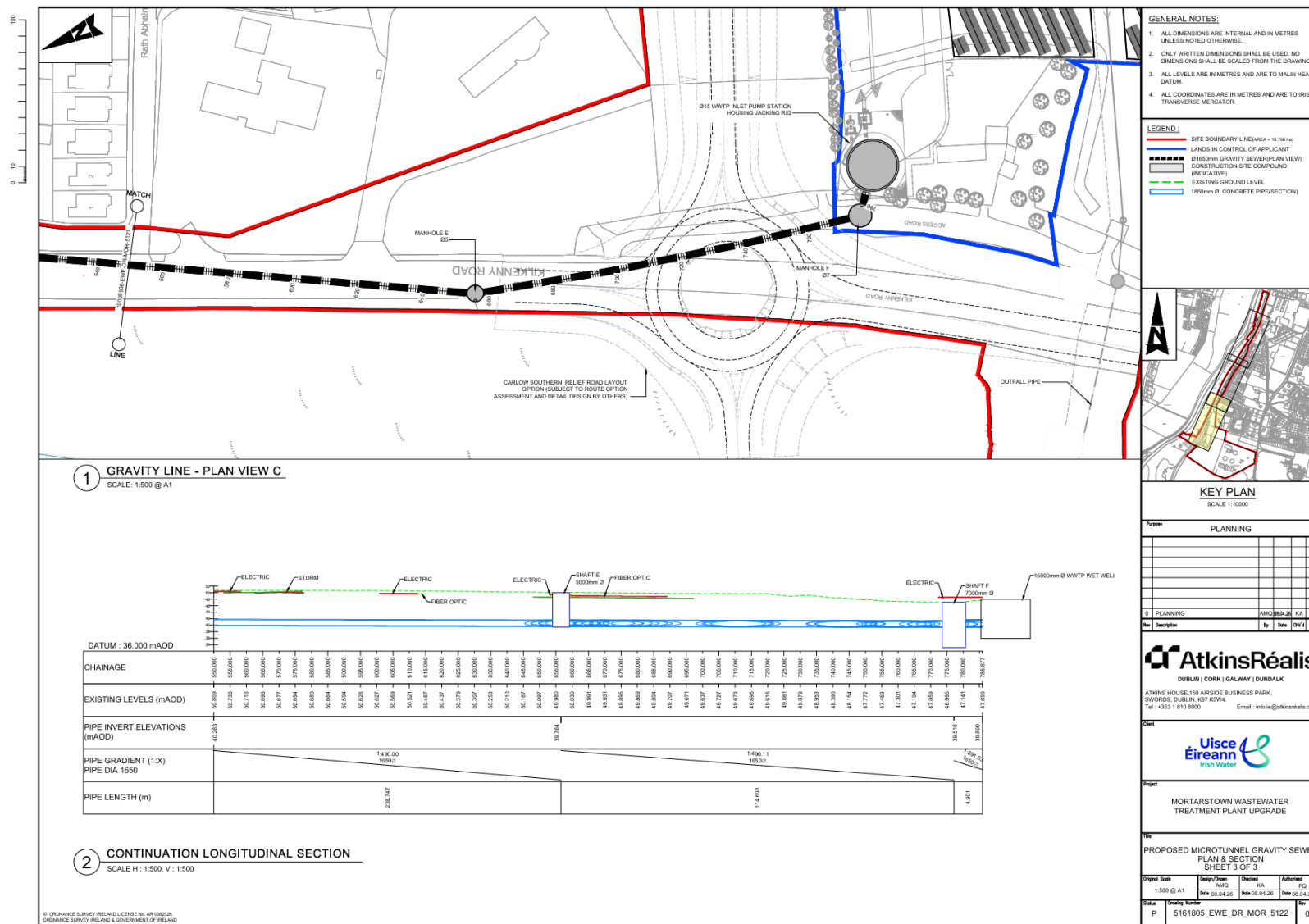


Figure 2-5 - Microtunnel Alignment and section (1).

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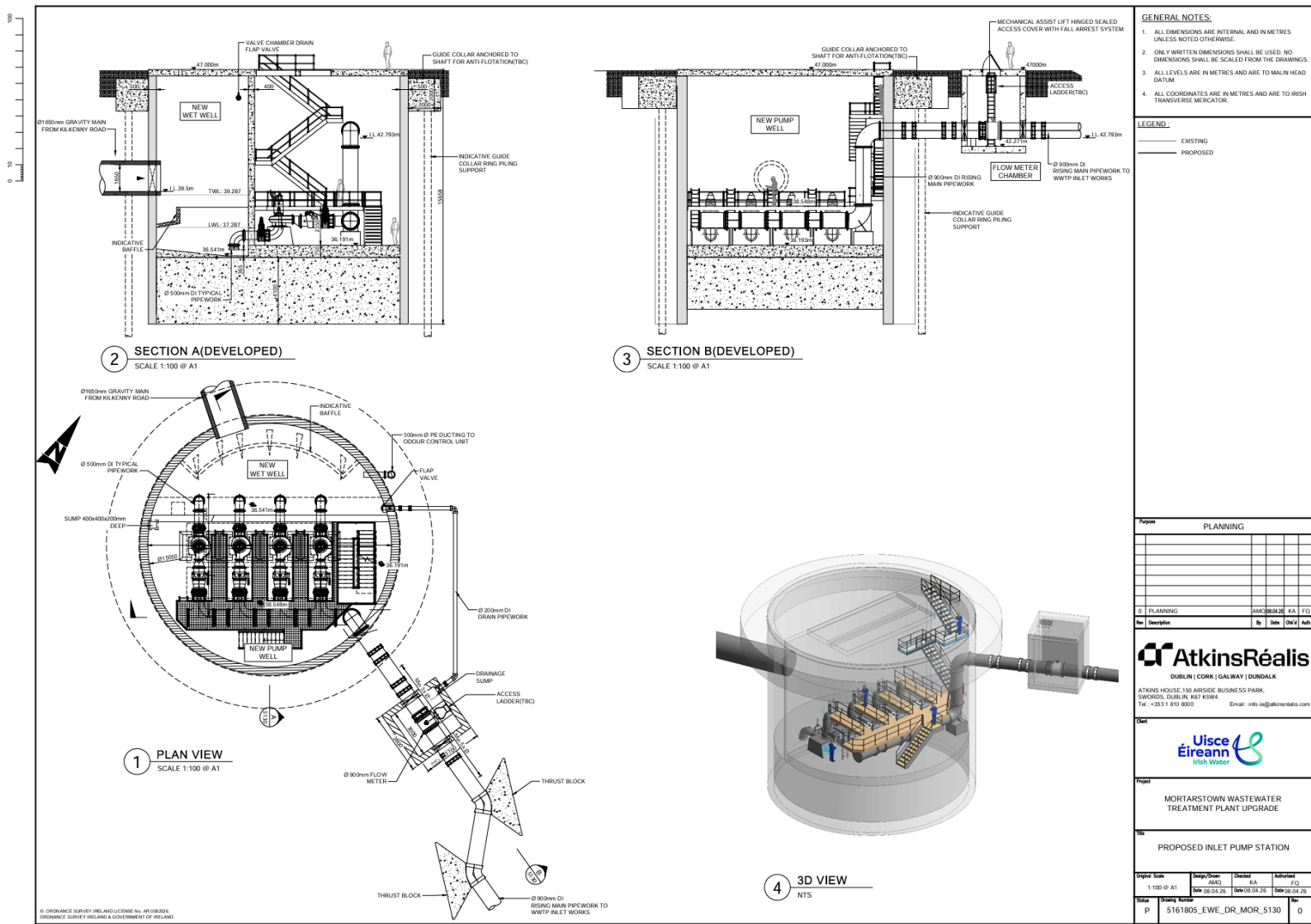


Figure 2-8 - New Inlet Pump Station plan and sections.

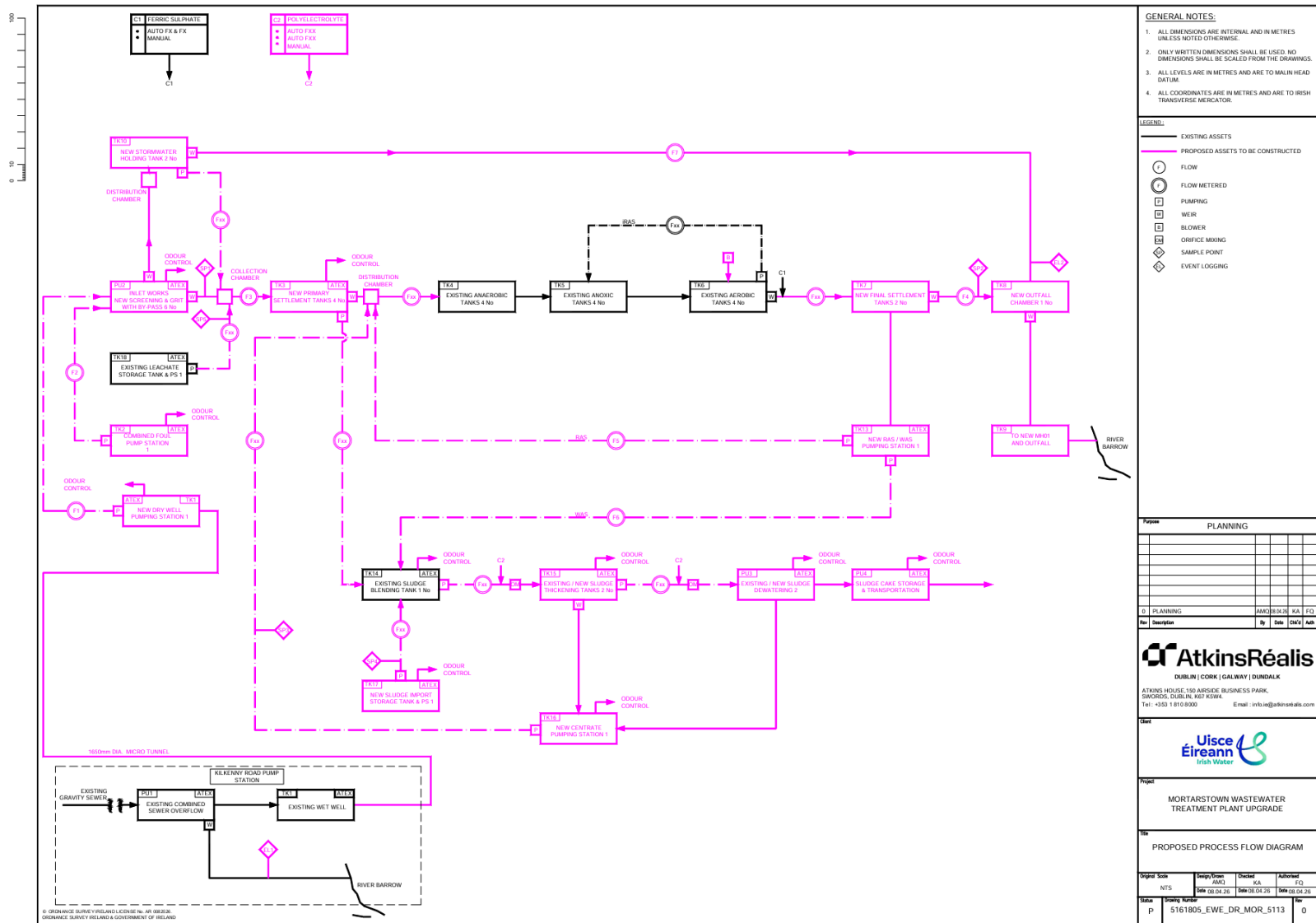


Figure 2-11 - Proposed Process Flow Diagram.

2.2 Demolition Phase

Existing plant/items to be demolished as part of the Proposed Development are listed as follows, and presented in Figure 2-12 below:

- Storm tank (area 616m²);
- Inlet works (area 166m²);
- Various small chambers within the site (2 no. chambers, area 3m² and 14m²); and,
- Existing sludge cake transfer facility (area 100m²).

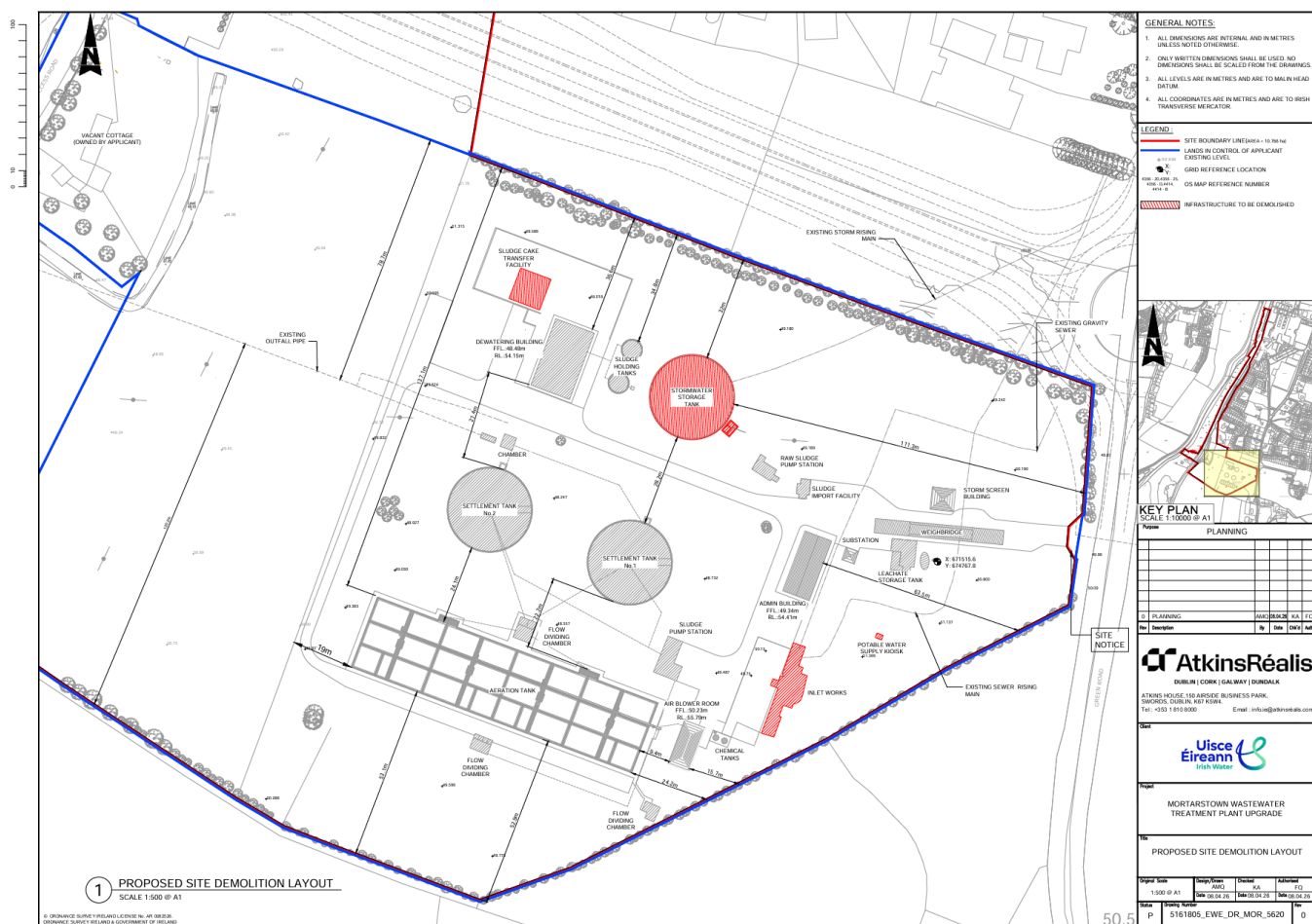


Figure 2-12 - Proposed Site Demolition Plan.

2.3 Decommissioning Phase

Existing plant/items to be decommissioned as part of the Proposed Development are listed as follows:

- Kilkenny Road pumping station;
- Existing rising main; and,
- Existing settlement tanks (2no.).



Refer also to Figure 2-9 – Proposed WwTP Layout, which shows the locations of the existing sewer, existing settlement tanks and rising main scheduled to be decommissioned.

An Asbestos Refurbishment Survey Report (OHSS, 2018), presented in Appendix 2-1, Volume 3 of this EIAR, was prepared which identified asbestos containing materials (ACM) within the existing WwTP as shown below. As stated by OHSS, the identified asbestos containing materials are intact and in use. This report recommends that the ACMs are removed in advance of any refurbishment or demolition works within the existing WwTP, and ACMs should only be removed by a competent contractor in compliance with all relevant waste management and Health and Safety legislation.

An Asbestos Survey of the Kilkenny pump station (scheduled to be decommissioned) will be undertaken prior to commencement of the proposed decommissioning works.

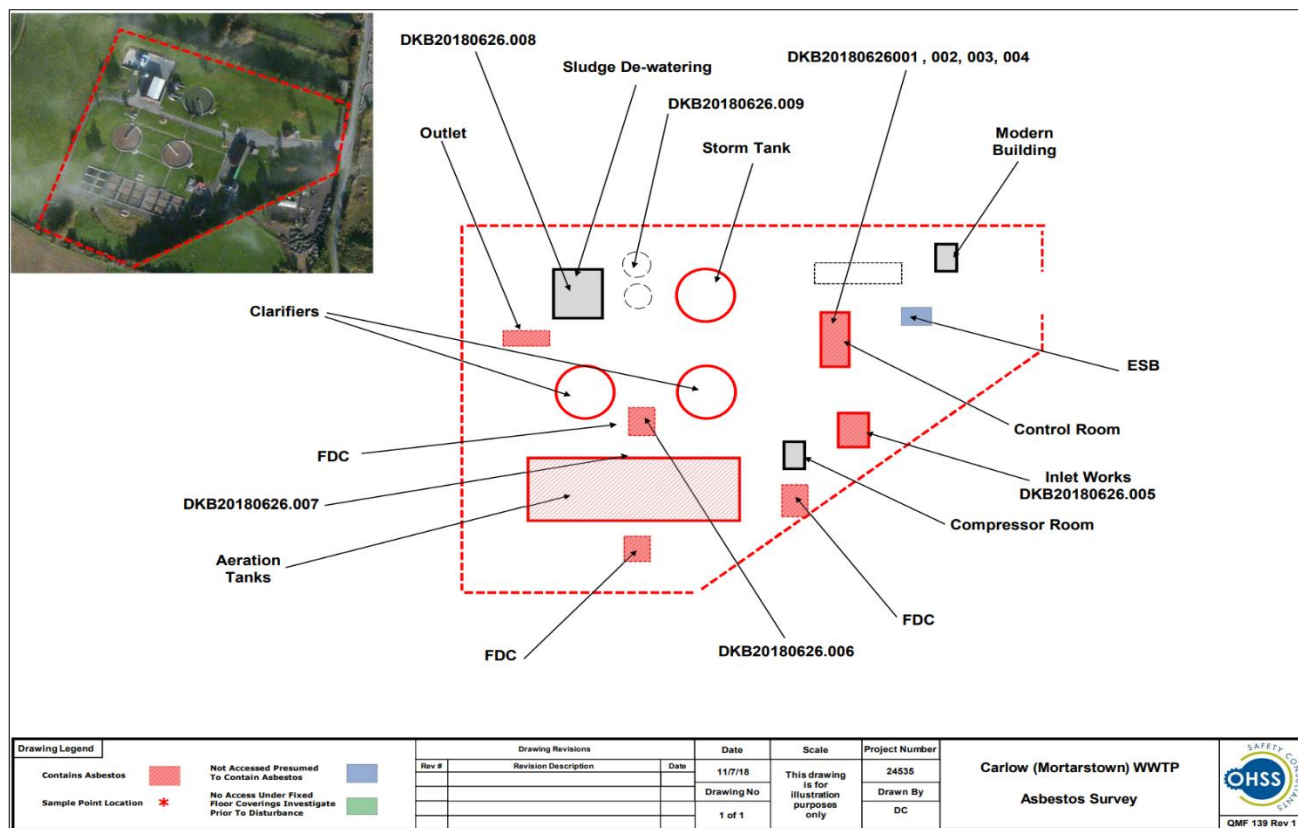


Figure 2-13 - The WwTP site assessed in the Asbestos Survey.

2.4 Future Decommissioning of Mortarstown WwTP

Mortarstown WwTP is owned and operated by UÉ. They will be responsible for the future intentions of this facility if the plant were decommissioned. The design lifespan of the upgraded plant is 25 years but it is anticipated that it will be maintained, with periodic upgrading undertaken over a longer lifetime to meet future demand and upgrades in technology.

In the event of facility shutdown UÉ will decommission, render safe or remove for disposal/recovery, all materials, waste, ground, plant and equipment that could result in environmental pollution.



Decommissioning would follow a staged, compliant process focused on safety, environmental protection, and traceable documentation in accordance with prevailing best practice at the time of closure, and all relevant EPA requirements, under the relevant EPA waste licence.

A decommissioning plan will be prepared, including stakeholder notifications, risk assessments (covering odour, confined spaces and residual chemicals), and a method statement for flow diversion. It is anticipated that any shutdown of all or part of the site operations would be preceded by a scaling down of activities therefore further reducing the quantities of materials, particularly chemicals to be dealt with. Wastewater would be gradually rerouted to the replacement works or temporary treatment so the plant could be safely run down.

The decommissioning process would involve the safe isolation of all infrastructure, removal of gas, and the de-energisation of equipment. All tanks and pipelines would be isolated, drained, cleaned, and made gas-safe, with residual sludge dewatered and removed to an approved facility. Above-ground equipment, such as valves, pipework, gantries, platforms, kiosks, and associated infrastructure, would be dismantled and removed from site by suitably qualified contractors. Materials would be segregated and sent for re-use, recycling, or licensed disposal in line with legislative requirements and commercial viability.

MEICA systems would be de-energized, disconnected, and either removed for reuse/recycling or disposed of per Waste Electrical and Electronic Equipment (WEEE) and hazardous waste disposal requirements.

Structural works would then proceed under a demolition plan and civil structures would be demolished using controlled methods, with concrete and steel segregated for recycling. Sub-surface foundations may be broken to a depth of 1m below ground level, with the remainder left in situ.

Odour management would be maintained during cleaning and demolition. Any contaminated soils would be assessed and managed, as per the EPA Guidelines on Waste Classification, and remediated/disposed of to appropriately licenced waste facilities.

Site restoration would include backfilling/compaction, removal or grouting of any redundant below-ground structures to ensure long-term stability, final grading, and reinstatement of lands for future use.

Throughout, waste streams (sludge, screenings, grit, oils/fuels, polymers, electrical/electronic equipment, and general demolition arisings) would be tracked with consignment notes; air, noise, and water controls (silt, spills) would be monitored; and a final closure report would document environmental verification (soil and groundwater testing), and handover of residual buried assets (e.g., sections of microtunnel or outfall retained in situ) per the agreed end-state.

The costs associated with the decommissioning, removal, and disposal of the plant would be met by UÉ.

Successful decommissioning will only be complete when all buildings, infrastructure, equipment, materials, wastes or any other materials, which could result in environmental pollution, are removed from the site and recycled, recovered or disposed of in accordance with all regulations in force, and EPA requirements, at the time.

2.5 Preliminary Construction Sequence

The preliminary construction sequence outlined in Table 2-3 sets out the anticipated programme for the progression of the proposed development from planning through to operational commencement.

Table 2-3 - Estimated Construction Phasing Programme.

Milestones	Timeframe*
Submission of planning application	Q2 2026



ACP planning application decision	Q4 2026
Civil, structural, mechanical, electrical design, site survey works & mobilisation start.	Q1 2027 – Q3 2027
Construction and installation.	Q4 2027 – Q2 2029
Commissioning	Q1-2029 – Q2 2029
Operational Date	Q3 2029

**These timelines are estimated at this juncture, and assume that there will be no significant delays to the overall delivery programme through the planning, detailed design, mobilisation, construction and commissioning phases.*

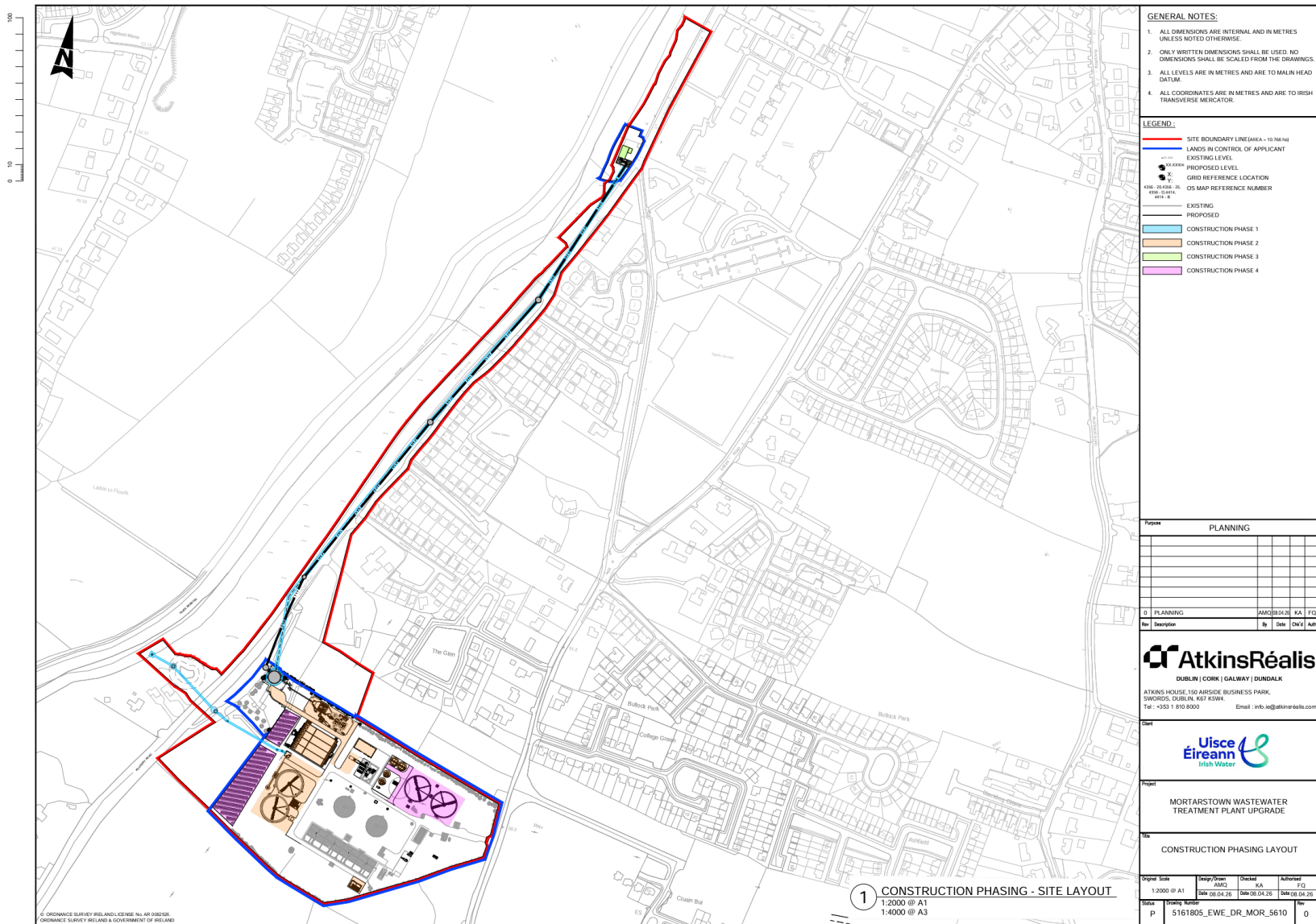
The construction activities for the development are anticipated to run for 18-20 months between Quarter 4 2027 and Quarter 2 2029.

At this preliminary juncture, the proposed construction works will comprise 4 no. key stages, summarised as follows, and presented in Figure 2-14.

- **Phase 1** - Construction of a new microtunnel gravity sewer between the existing Kilkenny Road pumping station and the new inlet pump station and construction of the outfall pipe and the headwall;
- **Phase 2** – Construction of inlet works, primary settlement tank, picket fence thickeners, blower building, storage shed, and other ancillary units;
- **Phase 3** – Decommissioning of the existing Kilkenny Road PS:
- **Phase 4** – Construction of the stormwater holding tanks.

Dry weather flow will be calculated by the Contractor to determine the available downtime for linking new elements of the works to ensure the stormwater storage works are scheduled in a period of dry weather.





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Figure 2-14 - Preliminary Construction Phasing.



Details of the proposed sequence of construction works are provided in the following section. It should be noted that this construction sequence is preliminary and may be subject to revision at a later stage of the development.

2.5.1 Microtunnel Gravity Sewer Construction

A trenchless construction methodology, pipe jacking, will be used to install the underground pipeline, by pushing specially designed pipes through the ground using high-capacity hydraulic jacks from a launch shaft. A working area within the red line boundary, will be provided during construction for the installation of the launch chamber, at the existing WwTP site.

The construction of the tunnel will involve 4 no. key stages including:

- Construction of the launch chamber / new inlet pump station .
- Installation the new gravity sewer from the launch chamber (at the existing WwTP site) towards the existing Kilkenny Road Pumping Station wet well.
- Excavation of the reception / exit chamber at the southern side of the existing Kilkenny Road pumping Station wet well and completion of the tunnel connection into the new Shaft B. Note the connection between the new Shaft A and the existing Kilkenny Road wet well is not to be completed at this point. Establishment of the connection is described in Section 2.5.3.2.
- Completion of the construction of the new WwTP inlet pump station including wet well, dry well and downstream pipework offline at new intake works.
- Connection of inlet pump station to the microtunnel.

Refer to Figure 2-15 below for drawings showing the excavation of the reception chamber and construction of the new WwTP Wet Well.

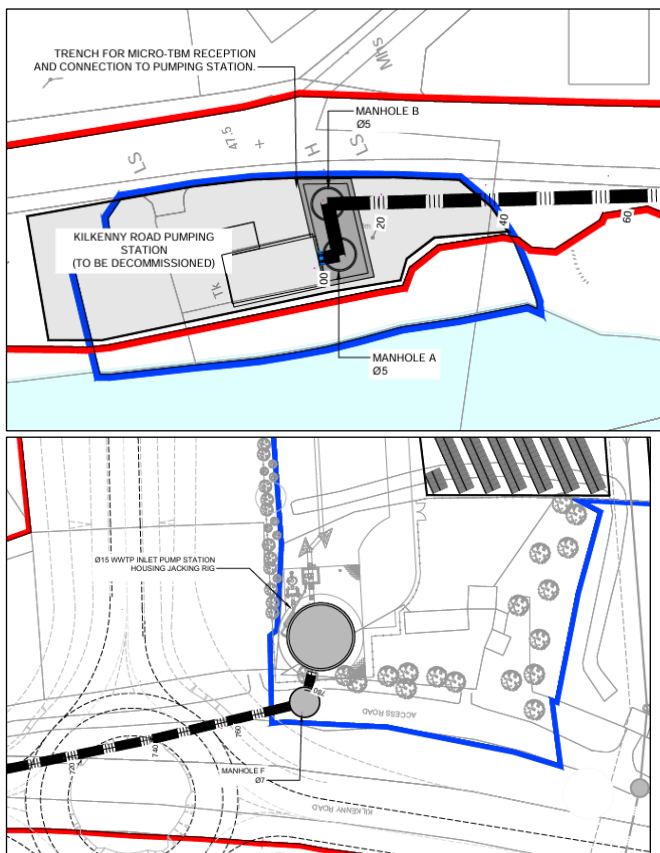
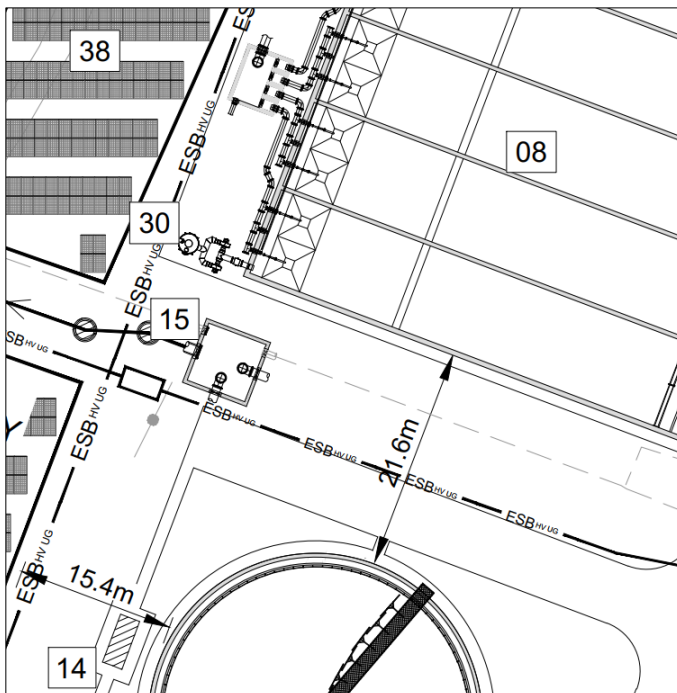


Figure 2-15 - Drawings showing the proposed Micro TBM launch zone location and construction of the new Inlet Pump Station.

2.5.2 Waste Water Treatment Plant (WwTP)

The construction of the WwTP will involve 11 no. key stages including:

- Construction of the new screening and grit control inlet works offline.
- Construction of the new Storm Tank 2 (tank at the east)
- Construction of the new Primary Settlement Tanks, Final Settlement Tanks and associated pipework, chambers and pumping stations (RAS / WAS, etc.)
- Installation of sludge thickening tanks, sludge dewatering units, upgrade sludge import facility and installation of all associated chambers offline. Install and connect upstream and downstream pipework to these units offline.
- Installation of the temporary cofferdam on the River Barrow utilising a barge for driving the sheet piles.
- Construction of the proposed outfall pipework, chambers and new outfall chamber and headwall. Note the connection to the new upstream combined effluent chamber (numbered as “15” in Figure 2-16) should be completed at a later stage. Establishment of this connection is described in Section 2.5.4.2.



- Installation of the new dewatering press, new sludge cake pumps and upstream and downstream pipework offline.
- Completion of necessary modifications to thickened sludge feed pumps arrangement and connect thickened sludge pipework upstream and cake pipe work downstream of the new dewatering unit to the existing pipework.
- Commissioning of the new sludge dewatering facilities. This step should be performed outside of normal sludge dewatering operational hours.
- Installation of the new air blower building, 4 no. new air blowers, associated equipment and pipework offline.
- Connection and commission of the air blower pipework to the existing aeration tanks and decommission the existing air blowers and associated building. Commission the new sludge dewatering facilities.

Figure 2-16 - Drawing showing the new combined effluent chamber.

2.5.3 Kilkenny Road Pumping Station Connection

2.5.3.1 Temporary Overpumping to Allow Modifications to Existing Wet Well

An existing manhole upstream of the Kilkenny Road pumping station is fed from 3 no. existing pipelines, namely a Ø750mm dia, a Ø600mm dia and a Ø225mm dia. pipe. The Ø225mm dia pipe will be intercepted and diverted to reception Shaft B. The remaining large pipes shall be overpumped to reception Shaft B. This will allow flows



to be isolated and the connection to Shaft A be made. Emergency overflows will remain operational, as per the current operational regime.

2.5.3.2 Kilkenny Road Pumping Station Connection to Tunnel

A connection will be made from the southern side of the existing wet well to the new Shaft A. Flows will then be reinstated to the existing wet well and allowed to overflow to the reception Shafts A and B (refer to Figure 2-5) and the new tunnel until testing and commissioning of the tunnel, the new pumping station and the new inlet works are complete. The existing pumping station will serve as a back-up during this period.

2.5.3.3 Wet Well Modifications

Once testing and commissioning are complete, flows will be isolated upstream of the existing wet well and overpumped again to allow modifications to the existing wet well. The invert level of the wet well floor will be raised to provide at grade gravity flows to the outfall. Overflows to be maintained and modifications to be made as required.

Once works are complete, upstream flows will connect via the modified wet well to the new gravity tunnel. All existing infrastructure and equipment will be decommissioned to ensure no hazards remain.

2.5.4 Connection of New Infrastructure into Treatment Process

It is proposed to complete the following 3 no. connections outlined below, to allow for transfer of the flows from the existing process to the new process. It will be required to complete these works during dry weather flow. Current estimates of available attenuation indicate that flows to the WwTP can be isolated for a maximum of ca. 3 hours in the new tunnel to complete these works.

2.5.4.1 WwTP Connection No.1

It is proposed to isolate the flows coming from the existing inlet works to the chamber (pointed by the green arrow), immediately upstream of the aeration tank (numbered as "09" in Figure 2-17). The next step will be to complete the connection of the proposed pipework from the proposed Primary Settlement Tanks to chamber immediately upstream of the aeration tank. Note: The connection of the Kilkenny Road (noted in 2.5.3 above) should be completed to enable the storage in the tunnel and primary settlement tanks to be utilised during these works.



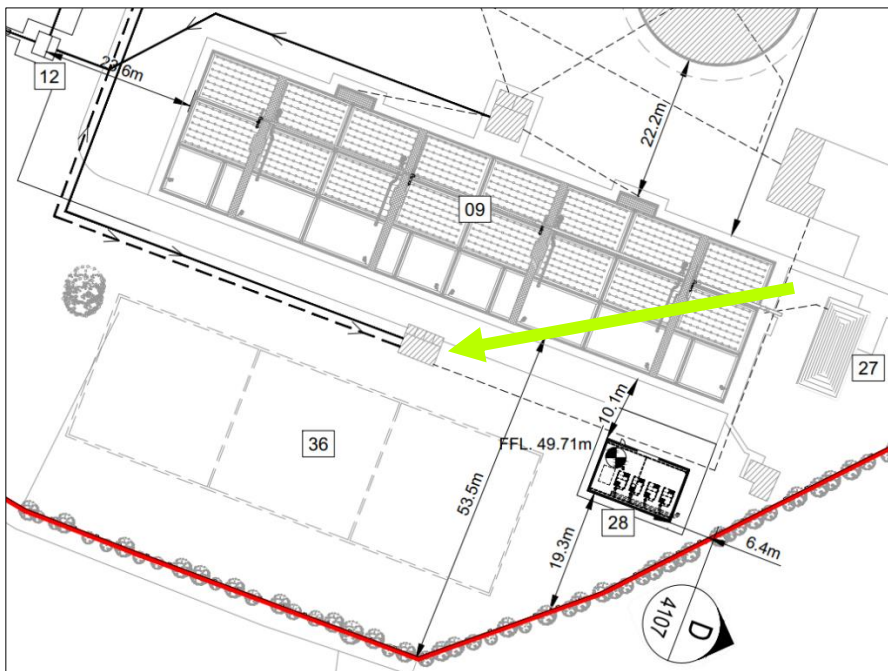


Figure 2-17 - Connection Point 1 - Splitter chamber upstream of Aeration tanks.

2.5.4.2 WwTP Connection No.2

It is proposed to isolate the flows coming from the existing aeration tank (numbered as “09” in Figure 2-18). The next stage will complete the connection of the proposed pipework from the proposed Final Settlement Tank into the chamber (pointed by green arrow) immediately downstream of the aeration tank. This will enable the diversion of flows to the proposed Final Settlement Tank.

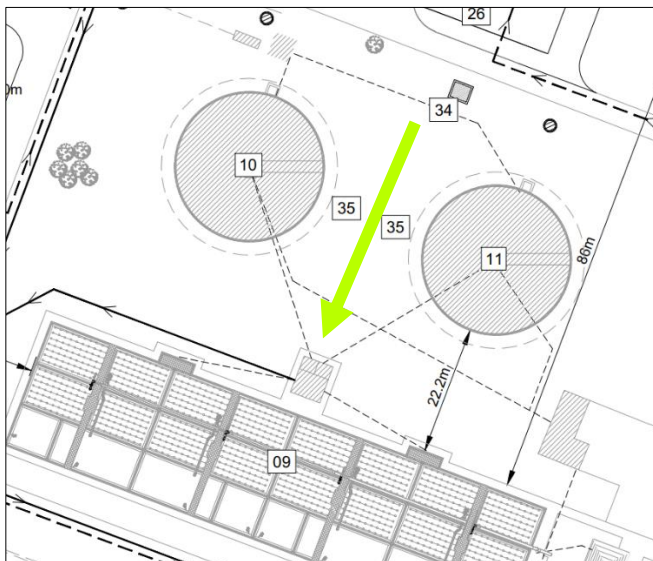


Figure 2-18 - Connection Point 2 - Splitter chamber to Final Settlement Tanks.

2.5.4.3 WwTP Connection No.3

Flows coming from the new upstream combined effluent (numbered as “15” in Figure 2-19) chamber will be isolated. The next step will complete the connection of the proposed pipework into this chamber. This will enable the diversion of flows to the new outfall, through the new processes in the WwTP and commencement of the commissioning stage of this infrastructure.



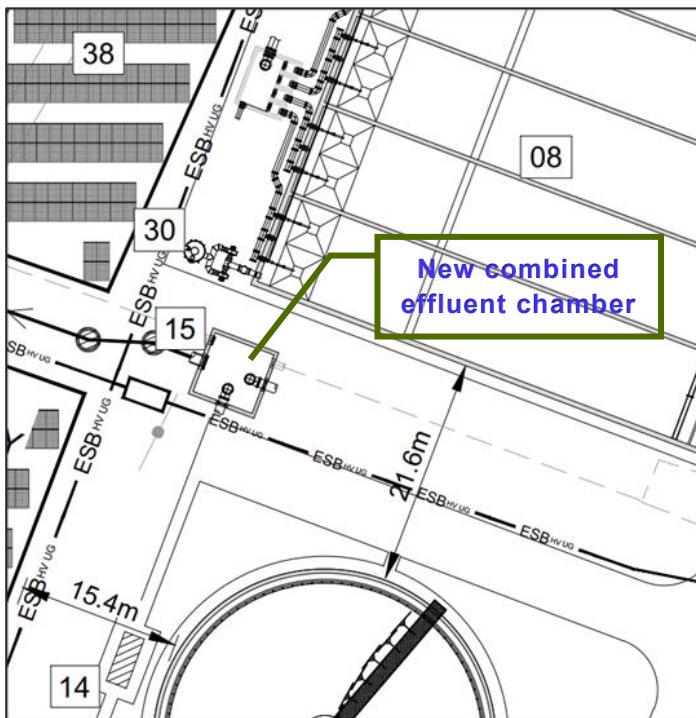


Figure 2-19 - Connection Point 3 - New combined effluent chamber.

2.5.4.4 Stormwater Storage

Following the diversion of the flows to the new process stream, the existing storm tank will be demolished and the new stormwater Tanks A and B in Figure 2-20, with associated pipework and chambers will be constructed. Each tank will have a storage capacity of 3,115m³. It is noted that this must be carried out during dry weather flows. Contingency stormwater storage can be provided in the tunnel and potentially the existing final settlement tanks, during the proposed works.

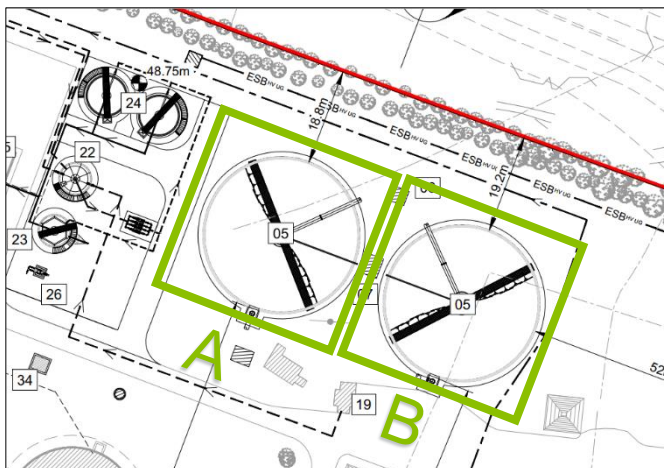


Figure 2-20 - Drawing showing the Stormwater Storage.

2.5.5 Commissioning

When the proposed infrastructure is constructed and connected into the process stream, a 3-month commissioning phase will commence, All existing infrastructure proposed for decommissioning will be retained

for this period to act as a standby system, in the event of any commissioning issues, the existing infrastructure can be recommissioned into the process to enable to rectification / remedial measure to be completed.

2.6 Construction Aspects

Construction works will take place between 8am and 6pm Mondays to Fridays inclusive, and between 8am and 1pm on Saturdays, with no works taking place on Sundays or Public Holidays. Deviation from these times will only be allowed in exceptional circumstances where prior written approval has been received from Carlow County Council.

2.6.1 Site Compounds

As depicted in Figure 2-21 to Figure 2-22, the site compounds including site offices, material storage and parking will be established in 3 no. locations within the red line boundary, namely 2 no. at the WwTP site and 1 no. immediately north of the existing Kilkenny Road PS.

For the works at the WwTP site, the site compound will be located at the available area to the south of the existing aeration tanks. This will be the primary location for site offices, self-contained temporary welfare facilities, and material storage. A second designated compound for temporary construction stage parking (with 18 no. parking spaces) will be located to the left of the existing site entrance. A designated walkway defines the pedestrian route from the car park to the site compound to the south. All construction traffic will access the WwTP compounds via the existing WwTP entrance.

The third site compound will be located north of the existing Kilkenny Road PS for storage and set down of materials. This compound will be accessed via an existing gate on Kilkenny Road.



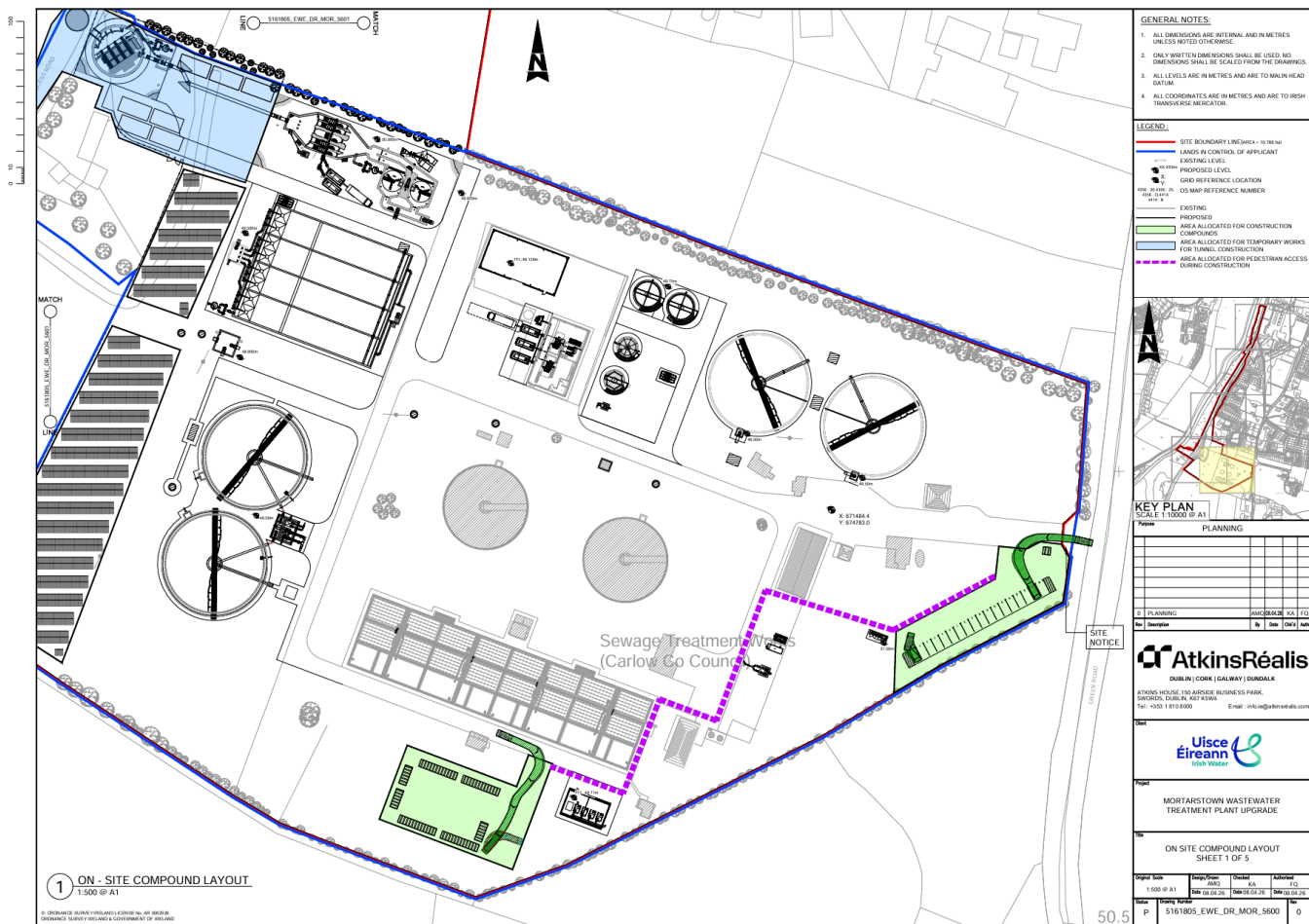


Figure 2-21 - Preliminary Construction Site Compounds (1 of 2).

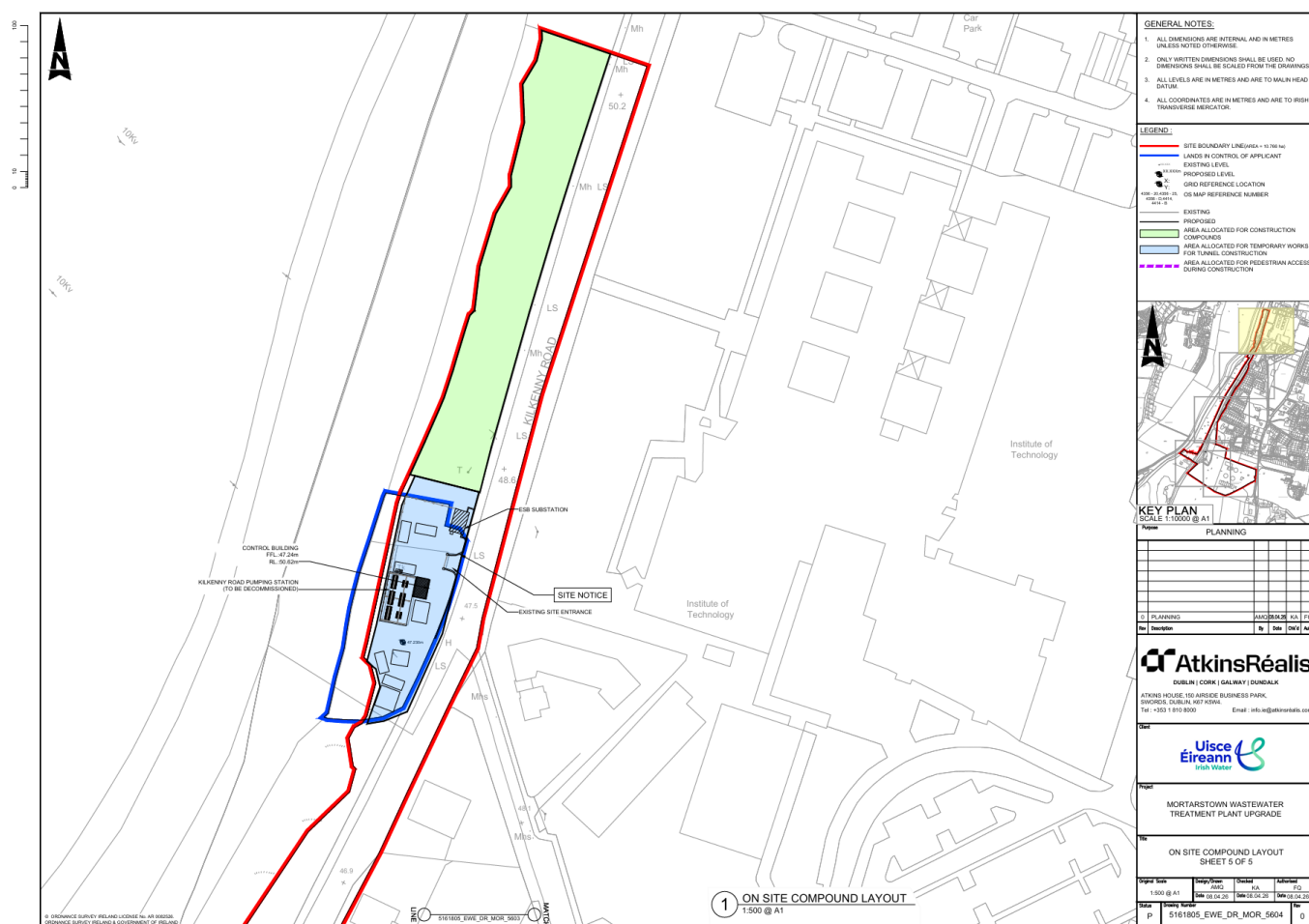


Figure 2-22 - Preliminary Construction Site Compounds (2 of 2).

2.6.2 Traffic Management

The proposed transport routes for all construction traffic entering and egressing the WwTP site, for the full duration of the ca. 18 - 20 month phased construction period will be through the existing access point to the WwTP site. Construction traffic will access the existing Kilkenny Road PS site via the existing PS entrance and will access the site compound to the north via an existing entrance from Kilkenny Road.

All construction activities will be managed and informed by a Construction Traffic Management Plan (CTMP) which will be implemented by the Contractor. The details of the CTMP will be agreed with the Carlow Co. Council Roads Department in advance of construction activities commencing on site. Refer to Chapter 10 Traffic of this EIAR and the Construction Environmental Management Plan (CEMP) submitted as Appendix 2-2. Volume 3 of this EIAR.

2.6.3 Environmental Management

The construction of the Proposed Development will comply with the CEMP submitted as Appendix 2-2. Volume 3 of this EIAR (which takes account of the Schedule of Environmental Commitments presented within this EIAR). This document will be further developed and added to within the project specific Detailed CEMP which will be prepared by the Contractor in advance of the construction and demolition works, and will be fully implemented onsite for the duration of the construction and demolition phase of the project. Environmental monitoring will be

carried out during the construction phase as detailed in Chapter 18 of this EIAR - Schedule of Environmental Commitments.

2.6.4 Waste Management

The construction of the Proposed Development will be in accordance with the Construction and Demolition Resource and Waste Management Plan (RWMP) (AtkinsRéalis, 2026) submitted as Appendix 2-3. Volume 3 of this EIAR which was prepared in accordance with the relevant following guidance 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition projects' (EPA, 2022).

The Construction & Demolition RWMP provides a mechanism for monitoring and auditing waste management performance and compliance for the duration of the project. The document also provides a detailed overview of key waste management considerations for the proposed development at this preliminary stage, while also allowing for further enhancement as the proposed development progresses through to the detailed design and construction stages. This document will be further developed and added to within the project specific Detailed Resource and Waste Management Plan which will be prepared by the Contractor in advance of the construction phase and will be fully implemented onsite for the duration of the construction phase of the project. All waste handling and management will be as the requirements of the Waste Management Act 1996 as amended and other relevant waste management legislation. The Contractor will be required to keep all waste management records including, but not limited to, waste haulage contractors, types and quantities of waste taken off site and final destination for recycling/disposal of the material. Gate tickets will be kept by the Contractor and will be available for review by the competent authority or the Client.

Estimated waste volumes are summarised in Table 2-4 below.

Table 2-4 – Summary of estimated Construction and Demolition Waste Volumes.

Construction Phase	m³
Imported fill	45 000
Excavated material	88 834
Material to be reused on site	2 500
Contaminated soil to be removed off site	334
Remaining Material to be removed off site	86 000
Construction and Demolition Waste	m³
Construction	1060
Demolition	876
Demolition Phase	
Total	876m ³
Operational Phase	kg/per month
Screening	7 724
Grit Removal	54 000
Dewatered Sludge	264 000
Admin Building (Dry Recyclables)	72



Future Decommissioning of WwTP	m³
	30 000

2.7 Operational Aspects

2.7.1 Discharge Licence

2.7.1.1 Existing Wastewater Discharge Licence (WwDL)

The Urban Wastewater Treatment Directive (UWWD) Regulations 2001 (amended in 2004 and 2010) sets standards to be met in the collection and treatment of wastewater as well as the monitoring requirements for wastewater discharges from urban areas. The Environmental Protection Agency Issues licences for WwTP discharges to environmental waters in accordance with the requirements of the UWWD. The discharge licence for Mortarstown WwTP was most recently granted under this legislative instrument in August 2009 (EPA WwDL Ref: D0028-01), with technical amendments in October 2011, December 2016 and December 2021.

The proposed discharge pipe is ca. 10m from the existing licenced discharge pipe (EPA WwDL Ref: D0028-01). A new discharge licence application / licence amendment will be sought for the proposed upgrade to the WwTP to reflect the proposed uplift in contributing PE.

2.7.1.2 Proposed Development - Treatment Standards / Wastewater Discharge Licence (WwDL)

The WwDL establishes Emissions Limit Values (ELVs) for certain chemical characteristics, which the plant's final effluent discharge is required to comply with.

An update to the existing ELV's will be required within the new discharge licence application / licence amendment for the WwTP. As part of the proposed design, assimilative capacity calculations have been undertaken. The River Barrow has sufficient assimilative capacity to accept the increased discharge from the upgraded WwTP. A full WAC analysis is presented and discussed in Chapter 12 – Water of this EIAR.

2.7.2 Landscaping

The proposed planting strategy for Mortarstown WwTP is designed to integrate the site sensitively into the surrounding landscape, enhance visual screening, and support biodiversity. Retention of existing vegetation, supplemented with additional native hedgerows, grassland management, ponds and tree planting, will mitigate the visual and ecological effects of the works while contributing to the overall landscape character of the area.

All planting proposed within the Mortarstown WwTP site will comprise native species of Irish provenance.

Existing screen planting along the northern, eastern, and southern boundaries of the site will be largely retained. Additional native species hedgerows will be planted along the entire boundary to the extension to the site to increase biodiversity. These hedgerows, as they mature, will also provide screening.

Grassland areas within the site will be managed to enhance biodiversity. Short grassland areas will be managed through a mowing regime of five cuts per year at approximately six-week intervals, with all arisings removed. Long grassland areas will be managed through a single annual cut, with all arisings removed.



Two wildlife ponds, incorporating marginal planting and pondside trees to provide partial shading, will be provided within the Mortarstown WwTP site. Additional orchard tree planting will be provided within the rear garden of the derelict cottage located to the west of the site.

Replacement tree and hedgerow planting will be provided where sections of existing trees and hedgerows are removed along Kilkenny Road (in the vicinity of Southern Gardens and Carraig Abhainn) to facilitate shafts for micro-tunnelling works.

The small area of woodland removed south of the Kilkenny Road pumping station will be allowed to naturally regenerate following completion of the works. In addition, a native hedgerow will be planted adjacent to the existing stone boundary wall near the Kilkenny Road pumping station.

Refer to the Landscape and Management Plan (Appendix 6-4) submitted as part of this planning submission.

2.7.3 Waste Management

The operation of the Proposed Development will be in accordance with the Operational Waste Management Plan (WMP) (AtkinsRéalis, 2026) submitted as part of this planning application.

At present, sludge cake waste from the sludge facility is covered and transported off site by trailers. The sludge is stored 5 km away on a farm known as “Penders yard “ a covered facility, whereby the trailer can be driven in and tipped in large hangar type sheds. It is then land spread , with a land management programme through the waste management contractor ENVA. ENVA also manage the storage at Penders and there is adequate storage here to hold the sludge over the period from October to February when land spreading cannot happen.

Other waste to be considered from the site is the ragging and grit screenings from the inlet works and storm screen. These are 3no. standard skips which are always kept covered as they are filled and transported to a licensed facility.

2.7.4 Surface Water Management

The Mortarstown WwTP has an existing surface water drainage system which drains the existing roadways. The extension of the site to the west including the proposed WwTP will require a new surface water drainage system. This system includes infrastructure such as filter drainage along the access road, a kerb and gulley drainage system within the WwTP site and surface drainage outlet pipe to connect to the proposed storm water overflow pipeline which includes an oil/petrol interceptor prior to discharge via the existing outfall pipe to the River Barrow.

The proposed stormwater drainage network for the development is presented on the planning drawing reference: 5161805_EWE_DR_MOR_5190 and 5191 in the planning drawings submitted with this application.

2.7.5 Odour Control

There will be active odour management during the operation of the WwTP by means of the odour control units (OCUs) to be installed to the following process units:

- New Pumping Station
- New Inlet Works
- New Primary Settlement Tank
- Anoxic / Anaerobic Tank
- Sludge Blending Tank and Picket Fence Thickeners (New and Existing)



- Sludge Dewatering Building
- Local Foul Pump Station
- Centrate Pumps.

2.7.6 Potable Water (Mains)

Potable water supply for human consumption and use such as uses in canteen and other welfare facilities is provided from Carlow Town's existing water network mains. The existing potable water supply to the WwTP will be retained to continue the supply of potable water supply to the administration building, emergency shower and eye wash and hydrants at the WwTP site.

2.7.7 Clean Wash Water (Borehole)

The washwater supply to the process units is provided via an existing borehole located in the WwTP site, east of the administration building. The borehole system will be upgraded and washwater network will be expanded to cover the new process units and the inlet pump station during the operation phase.



3. Scope of Study

3.1 Legislative Context

3.1.1 Natura 2000

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (“the Habitats Directive”) is a legislative instrument of the European Union (EU) which provides legal protection for habitats and species of Community interest. Article 2 of the Directive requires the maintenance or restoration of such habitats and species at a favourable conservation status, while Articles 3 to 9, inclusive, provide for the establishment and conservation of an EU-wide network of special areas of conservation (SACs), known as Natura 2000, which also includes special protection areas (SPAs) designated under Article 4 of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (“the Birds Directive”). Both SACs and SPAs are commonly referred to as “European sites” or “Natura 2000 sites”.

SACs are selected for natural habitat types listed on Annex I to the Habitats Directive and the habitats of species listed on Annex II to the Habitats Directive. SPAs are selected for species listed on Annex I to the Birds Directive, other regularly occurring migratory species and other species of special conservation interest. The habitats and species for which a Natura 2000 site is selected are referred to as the “*qualifying interests*” of that site and each is assigned a “*conservation objective*” aimed at maintaining or restoring its “*favourable conservation condition*” at the site, which contributes to the maintenance or restoration of its “*favourable conservation status*” at national and European levels.

3.1.2 Appropriate Assessment

Article 6 of the Habitats Directive deals with the management and protection of Natura 2000 sites. Articles 6(3) and (4) set out the decision-making process, known as “*Appropriate Assessment*” (AA), for plans or projects in relation to Natura 2000 sites. Article 6(3) states: -

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

The first sentence of Article 6(3) provides a basis for determining which plans and projects require AA, i.e., those “*not directly connected with or necessary to the management of [one or more Natura 2000 sites] but likely to have a significant effect thereon, either individually or in combination with other plans or projects*”.

In *Waddenzee* (C-127/02), the Court of Justice of the European Union (CJEU) ruled that significant effects must be considered “*likely*” if “*it cannot be excluded, on the basis of objective information*”, that they would occur. This clearly sets a low threshold, such that AA is required wherever there is a reasonable possibility of significant effects on a Natura 2000 site. In the same judgment, the CJEU established that the test of significance relates specifically to the conservation objectives of the site concerned, i.e., “*significant effects*” are those which, “*in the light, inter alia, of the characteristics and specific environmental conditions of the site*”, could undermine the site’s conservation objectives.

In addition to the effects of the plan or project on its own, the combined effects arising from the plan or project under consideration and other plans and projects must also be assessed (see Section 7.1 for more details).



The last part of the first sentence of Article 6(3) defines AA as an assessment of the “*implications* [of the plan or project] *for the site in view of the site’s conservation objectives*”. In the second sentence, Article 6(3) requires that, prior to agreeing to a plan or project, the competent authority must “*ascertain*” that “*it will not adversely affect the integrity of the site concerned*”. In *Sweetman v. An Bord Pleanála* (C-258/11), the CJEU ruled that a plan or project “*will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of sites*”. On that basis, EC (2018) described the “*integrity of the site*” as “*the coherent sum of the site’s ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated*”. As such, the “*integrity*” of a specific site is defined by its conservation objectives and is “*adversely affected*” when those objectives are undermined. In *Waddenzee*, the CJEU ruled that the absence of adverse effects can only be ascertained “*where no reasonable scientific doubt remains*”.

The “*precautionary principle*” applies to all the legal tests in AA, i.e., in the absence of objective information to demonstrate otherwise, the worst-case scenario is assumed. Where the tests established by Article 6(3) cannot be satisfied, Article 6(4) applies (see explanation in Section 3.2 below).

3.1.3 Competent Authority

The requirements of Articles 6(3) and (4) are transposed into Irish law by, inter alia, Part 5 of the European Communities (Birds and Natura Habitats) Regulations, 2011 (as amended) (“the Habitats Regulations”) and Part XAB of the Planning and Development Act, 2000 (as amended) (“the Planning and Development Act”).³ As per the second sentence of Article 6(3), it is the “*competent national authorities*” who are responsible for carrying out AA and, by extension, for determining which plans and projects require AA. The competent authority in each case is the body responsible for authorising a plan or project, e.g. local or other public authorities, An Coimisiún Pleanála, the Environmental Protection Agency (EPA) or a Government Minister. In all cases, it is the competent authority who is responsible for determining whether or not a plan or project requires AA and for carrying out the AA, where required.

3.2 Appropriate Assessment Process

The AA process can be described as being made up of three distinct stages, as described below, the need to progress to each stage being determined by the outcome of the preceding stage.

Stage 1: Screening – This stage involves a determination by the competent authority as to whether or not a given plan or project required AA. As explained in Section 2.1, AA is required in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site, but for which the possibility of likely significant effects on one or more Natura 2000 sites cannot be excluded. The CJEU’s Judgment on *Eco Advocacy v. An Bord Pleanála* (C-721/21) and the *Opinion* of Advocate General Kokott in the same case set out the principles for identifying any aspects of a plan or project which may constitute what the CJEU termed in *People Over Wind* (C-323/17) “*measures intended to avoid or minimise harmful effects on a Natura 2000 site*” and, as such, cannot be taken into account in making an AA Screening determination. Consideration of the potential for in-combination effects is also required at this stage.

Stage 2: Appropriate Assessment – This stage involves a detailed assessment of the implications of the plan or project, individually and in combination with other plans and projects, for the integrity of the Natura 2000 site(s) concerned. This stage also involves the development of appropriate mitigation to address any adverse effects and an assessment of the significance of any residual impacts following the inclusion of mitigation. In *Kelly v. An Bord Pleanála* (IEHC 400), the High Court ruled that a lawful AA must contain complete, precise, and definitive findings

³ The Planning and Development Act, 2024 (as amended) repeals and replaces the Act of 2000. The provisions of Article 6(3) and (4) of the Habitats Directive are transposed by Part 6, Chapter 3 of the 2024 Act. However, this part has not yet been commenced.



based on examination and analysis, and conclusions and a final determination based on an evaluation of the findings. In the same judgment, the High Court stressed that, in order for the findings to be complete, precise, and definitive, the AA must be carried out in light of best scientific knowledge in the field and cannot have gaps or lacunae. In *Holohan v. An Bord Pleanála* (C-461/17), the CJEU clarified that AA must “*catalogue the entirety of habitat types and species for which a site is protected*” (i.e. the qualifying interests of the site) and assess the implications of the plan or project for the qualifying interests, both within and outside the site boundaries, and other, non-qualifying interest habitats and species, whether inside or outside the site boundaries, “*provided that those implications are liable to affect the conservation objectives of the site*”. The proposer of a plan or project requiring AA is furnishes the competent authority with the scientific evidence upon which to base its AA by way of a Natura Impact Statement (NIS) or Natura Impact Report (NIR). If it is not possible to ascertain that the plan or project will not adversely affect one or more Natura 2000 sites, authorisation can only be granted subject to Article 6(4).

Stage 3: Article 6(4) – If a plan or project does not pass the legal test at Stage 2, alternative solutions to achieve its aims must be considered and themselves subject to Article 6(3). If no feasible alternatives exist, authorisation can only be granted where it can be demonstrated that there are imperative reasons of overriding public interest (IROPI) justifying its implementation. Where this is the case, all compensatory measures must be taken to protect the overall coherence of Natura 2000.

The three stages described above are illustrated in Figure 2-1 below.



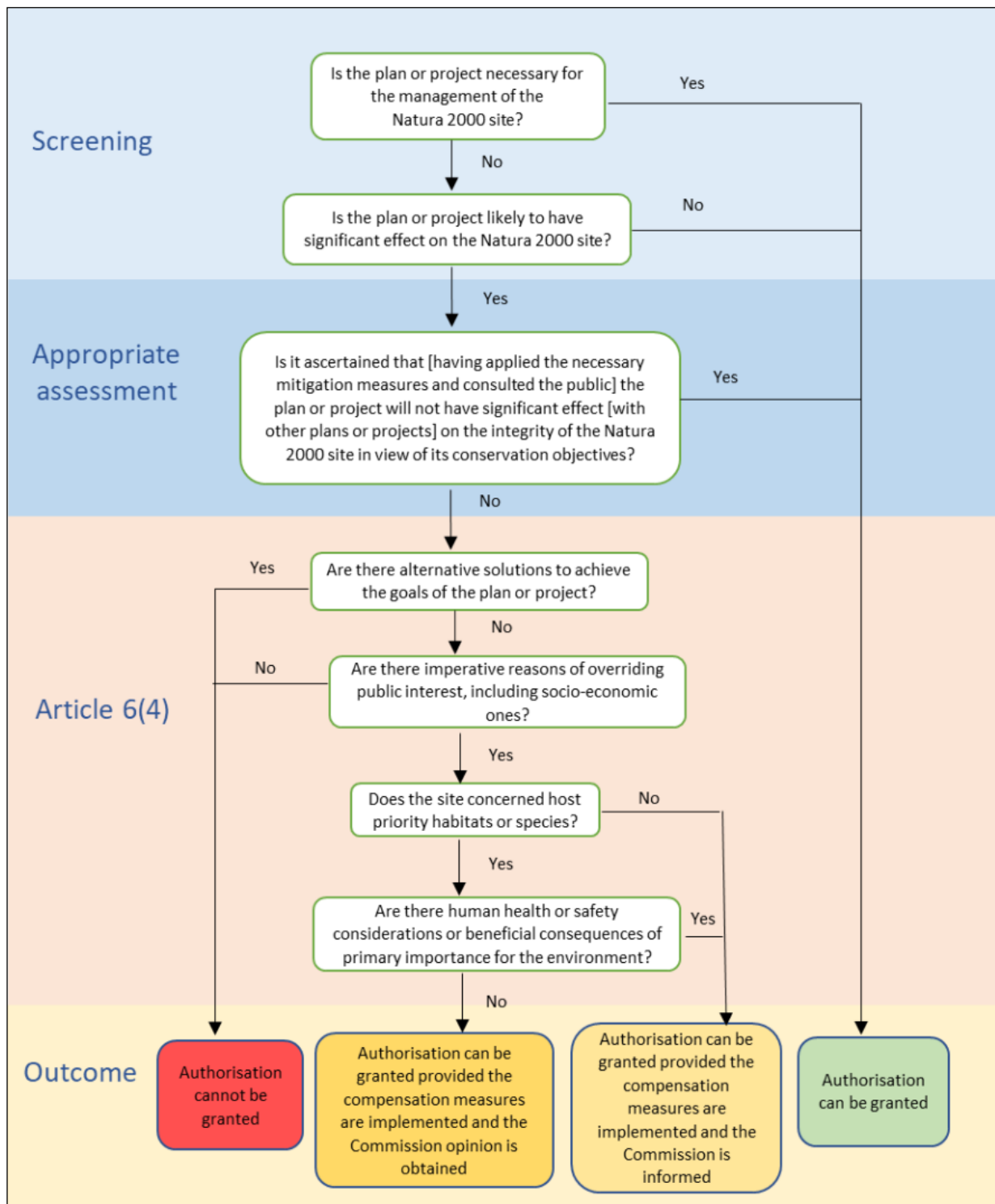


Figure 3-1 - Stages of the Appropriate Assessment process (EC, 2021a).

4. Methodology

4.1 Sources of Guidance

This report was prepared with due regard to the relevant European and Irish legislation, case law and guidance, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. *Official Journal of the European Communities* L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. *Official Journal of the European Union* L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. *S.I. No. 477/2011* (as amended) (“the Habitats Regulations”).
- Planning and Development Act, 2000. *No. 30 of 2000* (as amended) (“the Planning and Development Act”).
- Planning and Development Act, 2024. *No. 34 of 2024* (as amended) (“the 2024 Act”).
- Planning and Development Regulations, 2001. *S.I. No. 600/2001* (as amended) (“the Planning Regulations”).
- EC (2019). *Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission, Brussels. *Official Journal of the European Union* C 33/1-62.
- EC (2021a). *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC*. European Commission, Brussels. *Official Journal of the European Union* C 437/1-107.
- EC (2021b). *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive*. C (2021) 7301. European Commission, Brussels.
- DG Env (2022). *Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary*. Directorate-General for Environment, European Commission, Brussels. Publications Office of the European Union, Luxembourg.
- DEHLG (2010a). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Revised 11/02/2010*. Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b). *Circular NPW 1/10 & PSSP 2/10. Dated 11/03/2010*. Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2021). *Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. National Parks & Wildlife Service Guidance Series 1*, Department of Housing, Local Government and Heritage, Dublin.
- Mullen, E., Marnell, F. and Nelson, B. (2021). *Strict Protection of Animal Species – Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public Authority. National Parks & Wildlife Service Guidance Series 2*, Department of Housing, Local Government and Heritage, Dublin.



- OPR (2021). *Appropriate Assessment Screening for Development Management*. OPR Practice Note PN01. Office of the Planning Regulator, Dublin.
- Case law, including *Waddenzee* (C-127/02), *Sweetman v. An Bord Pleanála* (C-258/11), *Kelly v. An Bord Pleanála* (IEHC 400), *Commission v. Germany* (C-142/16), *People Over Wind* (C-323/17), *Holohan v. An Bord Pleanála* (C-461/17), *Eoin Kelly v. An Bord Pleanála* (IEHC 84), *Heather Hill* (IEHC 450) and *Eco Advocacy v. An Bord Pleanála* (C-721/21).
- Sundseth, K. and Roth, P. (2014). *Article 6 of the Habitats Directive – Rulings of the European Court of Justice*. Ecosystems LTD (N2K Group), Brussels.

4.2 Desk Study

Baseline data on the receiving environment, including Natura 2000 sites, was gathered through a thorough desk study, using both publicly available resources and specific data requests. The main sources of information were as follows⁴:

- National Parks & Wildlife Service (NPWS)
 - Designated site data downloaded from *NPWS: Maps and Data* (<https://www.npws.ie/maps-and-data>), including:
 - Spatial data for the boundaries of Natura 2000 sites and site-specific conservation objectives, and
 - Information on sites, including their overall structures and functions, qualifying interests, conservation objectives and threats/pressures and activities therein, was found in the Site Synopsis, Natura 2000 Standard Data Form, Conservation Objectives and supporting documents for each site.
 - Habitats and species datasets, including:
 - Reporting under Article 17 of the Habitats Directive (NPWS, 2025d-f) and Article 12 of the Birds Directive (*Article 12 web tool*) provided further information on the habitats and species concerned at the national level,
 - Records of species listed on the Flora (Protection) Order, 2022 (*NPWS Maps and Data*),
 - Woodland inventories (*NPWS Maps and Data*),
 - *Margaritifera*-sensitive Areas map (*NPWS Maps and Data*),
 - Water Framework Directive fish sampling data (*IFI Open Data*), and
 - Recent and historical records of protected and threatened species, including sensitive data (NPWS Data Request No. 2025_133).

⁴ Searches of these data sources included both general data extractions and targeted searches for specific information. As such, the same data source may have been accessed multiple times on different dates. Therefore, throughout this NIS, the date of last access to the relevant data sources are specified in relation to each specific piece of information.



- Environmental Protection Agency (EPA): Spatial and other data for rivers and other waterbodies from the *EPA Geoportal* (<https://gis.epa.ie/GetData/Download>) was used to identify any hydrological connection between the proposed works and Natura 2000 sites or connected features.
- Recent and historical records of species were obtained from the National Biodiversity Data Centre (NBDC) *Biodiversity Maps* (<https://maps.biodiversityireland.ie/Map>), including protected and threatened species and invasive non-native species.
- Satellite imagery and aerial mapping from Tailte Éireann, OpenStreetMap and Google Earth was reviewed to identify hedgerows, treelines and other potential ecological features.

The geographical scope of the species data request to the NPWS and the species records retrieval from the NBDC database is illustrated in Figure 4-1 below.



Figure 4-1 - Geographic scope of species data requests/searches

4.3 Field Surveys

As the proposed development has been in the early phases of development for several years, a number of site visits and surveys have been carried out and repeated or updated (over the period from 2018 to 2025) to inform the evolving design and environmental assessments. A summary of the surveys relevant to the NIS is shown in Table 4-1 below.

Full details of the methodology and results of surveys carried out directly by AtkinsRéalis are provided in the main body of this NIS. To avoid excessive repetition, summary details of the methodology and results of surveys carried out by sub-consultants are included in the main text, while their full reports are appended, as indexed in Table 4-1.

Table 4-1 - Summary of ecological surveys carried out for the proposed development.

Target	Method(s)	Surveyor(s)	Date(s)	Reference (reports appended)
Multi-disciplinary	Walkover to map habitats and invasive non-native plant species, and to record evidence of protected and threatened species	Atkins: Niamh Sweeney and Emma Nickelsen	12 th July 2018; 15 th September 2020	n/a (described fully in the NIS)
Multi-disciplinary	As above (validation)	Atkins: Niamh Sweeney	4 th November 2021	n/a (described fully in the NIS)
Multi-disciplinary	As above (validation and inclusion of new areas)	Atkins: Owen O'Keefe	21 st September 2022; 2 nd May 2023	n/a (described fully in the NIS)
Aquatic ecology	Electro-fishing (focussing on lamprey species); Fisheries habitat appraisal; SONAR survey (for bathymetry and bottom hardness)	Triturus: Ross Macklin, Bill Brazier and Derick Bora	15 th July 2021	Triturus (2021) <i>Fisheries assessment of Mortarstown WWTP upgrade works, Co. Carlow</i> . Triturus Environmental Ltd. (Appendix A.1)
Aquatic ecology	As above (validation)	Triturus: Ross Macklin and Derick Bora	3 rd July 2025	Triturus (2025). <i>Fisheries assessment of Mortarstown WWTP upgrade works, Co. Carlow</i> . Triturus Environmental Ltd. (Appendix A.2)
Woodland habitats	Vegetation and habitat survey of woodlands	Dr Mary O'Connor (independent expert)	27 th June 2023	O'Connor, M. (2023). <i>Mortarstown WwTP and Kilkenny Road WwPS - alluvial woodland survey</i> . Dr Mary O'Connor. (Appendix B)
Non-volant mammals	Trail camera monitoring	Sweeney Consultancy: Pascal Sweeney	13 th to 21 st September 2021 (inclusive)	Sweeney (2021). <i>Camera Trap Monitoring of Mammal Burrow at Mortarstown, Co. Carlow</i> . Sweeney



Target	Method(s)	Surveyor(s)	Date(s)	Reference (reports appended)
				Consultancy Ltd. (Appendix C)
Non-volant mammals	Targeted walkover; Trail camera monitoring	AtkinsRéalís: Owen O’Keefe and Alec Schmidt	27 th March to 10 th April 2025	n/a (described fully in the NIS)
Invasive non-native plants	Targeted walkover	Envirico: Julie Larkin	22 nd April 2021	Envirico (2021). <i>Invasive Alien Species Management Plan</i> . Envirico Ltd. (Appendix D.1)
Invasive non-native plants	Targeted walkover	INVAS: Tom Donovan	6 th May 2025	INVAS (2026). <i>Invasive Alien Plant Species Management & Biosecurity Plan</i> . INVAS Biosecurity Ltd. (Appendix D.2)

4.3.1 Walkover and Habitat Surveys

Initial multi-disciplinary walkover surveys were undertaken by Atkins⁵ ecologists during July 2018, September 2020 and November 2021. Further surveys were carried out in September 2022 and May 2023 to validate and update the previous surveys, ensure coverage of new areas within the updated red-line boundary, and achieve coverage across different times of the year.

Habitats were classified with reference to *A Guide to Habitats in Ireland* (Fossitt, 2000) and the *Interpretation Manual of European Union Habitats* (DG Env, 2013). The primary aim of these surveys was to gather baseline data relating to the potential ecological constraints on the proposed works with particular emphasis on the potential presence of qualifying interests of Natura 2000 sites. On completion of these surveys, habitats were mapped following *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011).

These surveys also included checks for invasive alien plant species, e.g. Japanese Knotweed (*Reynoutria japonica* syn. *Fallopia japonica*), and any evidence of protected mammals, particularly Otter (*Lutra lutra*), as well as recording of any incidental observations or evidence of presence of birds and other fauna.

During the non-volant mammal surveys carried out in March 2025 (described in Section 4.3.3 below), any notable changes to habitats since the earlier habitat surveys were recorded and the habitat mapping updated.

4.3.1.1 Limitations

There are not considered to be any significant limitations on the value of these surveys. They included visits which covered the full extent of the red-line boundary during both the optimal season for habitat surveys (April to September, inclusive) and times outside this season, i.e. November. They also cover multiple years.

4.3.2 Woodland Habitat Surveys

During the walkover surveys in autumn 2022 and spring 2023, part of the woodland between the Kilkenny Road and the River Barrow was identified as potentially corresponding to the Annex I priority habitat type “Alluvial forests with

⁵ At the time of these surveys, AtkinsRéalís Ireland Ltd was WS Atkins Ireland Ltd, trading as “Atkins”. In September 2023, Atkins and all other companies in the SNC Lavalin group rebranded as “AtkinsRéalís”.



Alnus glutinosa and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)' (91E0), which is a qualifying interest of the River Barrow and River Nore SAC. In order to confirm the status and extents of the different woodland areas, expert woodland ecologist/botanist Dr Mary O'Connor was commissioned.

Dr O'Connor carried out a detailed botanical and habitat survey of the woodland study area on 27th June 2023. This survey focussed particularly on woodland in the vicinity of the existing Kilkenny Road pumping station (in the northern part of the study area) and the existing outfall pipe and headwall (in the southern part of the study area).

Trees, shrubs and herbaceous plants present within these areas were recorded, topography, soil conditions and evidence of disturbance or management were noted, and the habitats were classified using Fossitt (2000). In addition, the vegetation composition of riparian woodland areas was classified using the Irish Vegetation Classification (IVC). Following this, conformity of the habitats to the priority Annex I habitat type '*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)' (91E0) was evaluated in light of an in-depth review of the relevant scientific literature, cross-referenced with available information on inundation patterns in the study area. The conservation value of these habitats was also considered in view of the site-specific conservation objective for alluvial woodlands in the River Barrow and River Nore SAC.

Full details of the methodology and results of the woodland survey and evaluation are presented in Dr O'Connor's report, which is presented in Appendix B to this NIS.

Alongside the ecological survey of the habitats, a detailed topographical survey was conducted by iO Geomatics, which accurately recorded ground levels at a high density of survey points across the study area. This facilitated the creation of a 3D surface model of the areas concerned. This model was used in conjunction with the 10% and 1% annual exceedance probability (AEP) flood heights⁶ to generate contours for these flood heights.

During this survey, Dr O'Connor was accompanied by Atkins ecologist Owen O'Keefe, who also recorded incidental observations of other ecological receptors, e.g. evidence of Otter and invasive non-native species. In addition, any notable changes to habitats since the earlier habitat surveys were recorded and the habitat mapping updated.

4.3.3 Non-volant Mammal Surveys

In addition to the trail camera monitoring by Sweeney (2021), a further walkover survey to identify the presence or evidence of the presence of protected or threatened mammal species was carried out by AtkinsRéalais Senior Ecologist Owen O'Keefe and AtkinsRéalais Graduate Ecologist Alec Schmidt on 27th March 2025. This was followed by further trail camera monitoring, as described below.

4.3.3.1 Walkover

Starting the walkover at 11:00, the air temperature was c. 14°C, with a gentle south-westerly breeze, c. 50% cloud cover, no precipitation, and excellent visibility. These were considered optimal weather conditions for surveying, and remained until the survey was completed at 16:00. There was no heavy rainfall or floods in the two weeks preceding the survey and there preceding four days were dry.

The geographic scope of the field survey, as illustrated in Figure 4-2 below, covered the footprint of the proposed development, with a particular focus on the areas highlighted in yellow, which included areas both within the red-line boundary and adjoining areas outside the red-line boundary, as the habitats in these areas were considered to be more likely to support mammals than areas such as open fields. The areas of particular focus for the mammal survey are described as follows:

⁶ Flood heights were taken (in the case of the outfall) and interpolated (in the case of the pumping station) from publicly available data in the Office of Public Works (OPW) South Eastern Catchment Flood Risk Assessment and Management (CFRAM) Study.



- The riverbank and adjoining areas from the south-western corner of the existing Kilkenny Road pumping station north (upstream) to the property boundary, c. 100m beyond the red-line boundary of the proposed development.
- The riverbank and adjoining areas of woodland and scrub for c. 150m south (downstream) of the existing Kilkenny Road pumping station. Further downstream, the vegetation becomes very dense, preventing access.
- The edge of the woodland adjoining the western verge of the Kilkenny Road along the full length of the proposed new gravity sewer, as well as the verge itself.
- The hedgerow adjoining the eastern edge of the Kilkenny Road along the full length of the proposed new gravity sewer, and adjoining amenity grassland in the housing estate.
- The vacant cottage sitting directly between the existing WwTP and the Kilkenny Road, including its outbuildings, gardens and surrounds, which includes areas of scrub.
- The existing WwTP itself, focussing on the boundaries and the area of rough grassland and scrub on the southern side of the campus.
- The area around the proposed outfall location and the adjoining woodland as far as c. 150m north (upstream) of the outfall point, covering the full width of this area between the Kilkenny Road and the River Barrow.

The survey areas were walked at a slow pace, allowing for a thorough search for any evidence of mammal presence in the study area, e.g. prints, tracks, hairs, droppings, other markings, burrows or other resting places, feeding signs, carcasses or direct observations of live animals.

Target notes and other observations, including notes on habitat suitability, along with photos of any mammal signs or any other points of interest, were recorded using the QField app for QGIS on a Samsung Galaxy S24 Ultra and later viewed in QGIS 3.34 for Windows.

4.3.3.2 Trail camera monitoring

Once the walkover was complete, 2 no. trail cameras were deployed as follows:

- 1 no. Bushnell CORE DS-4K No Glow camera was deployed in an area of scrub behind the cottage (ITM Grid Ref. 671257, 674876). This location was selected due to the presence of two potential mammal burrows, as well as a concentration of mammal signs such as paths, prints and droppings.
- 1 no. Spypoint FLEX-M camera was deployed on the riverbank about 25m north of the existing outfall (ITM Grid Ref. 671176, 674975). This location was selected due to a concentration of signs of Otter, including spraints and scratching on the riverbank and a low branch.

Both cameras were deployed on 27th March and collected on 10th April 2025, i.e. 14 nights after they were deployed, following which the videos were reviewed.

4.3.3.3 Limitations

The scope and extent of the field surveys were appropriate to the level of assessment required at this stage and these were also carried out in spring, when mammal signs are most visible due to the lack of vegetation but also when mammals are particularly active. Weather conditions were also favourable for the survey.

Access to lands south of the proposed discharge were not available, as such only lands within the red-line boundary south of the proposed discharge could be surveyed. Given the dense riparian vegetation present along this area a



boat survey was not suitable. There are two residential properties located immediately south of the red-line boundary which are separated from the River Barrow by a narrow strip of riparian vegetation. Given that there will be regular disturbance in this area due to the residential properties it is considered unlikely that otter holts are present in this area, considering the abundance of more suitable habitat in the immediate area. Therefore, this is not considered to be a significant limitation. It should be noted, however, that the field surveys were undertaken in 2025 and so the results represent a snapshot of mammal use of the site during 2025 only and, as with any survey carried out in a single year, cannot account for variations between years.



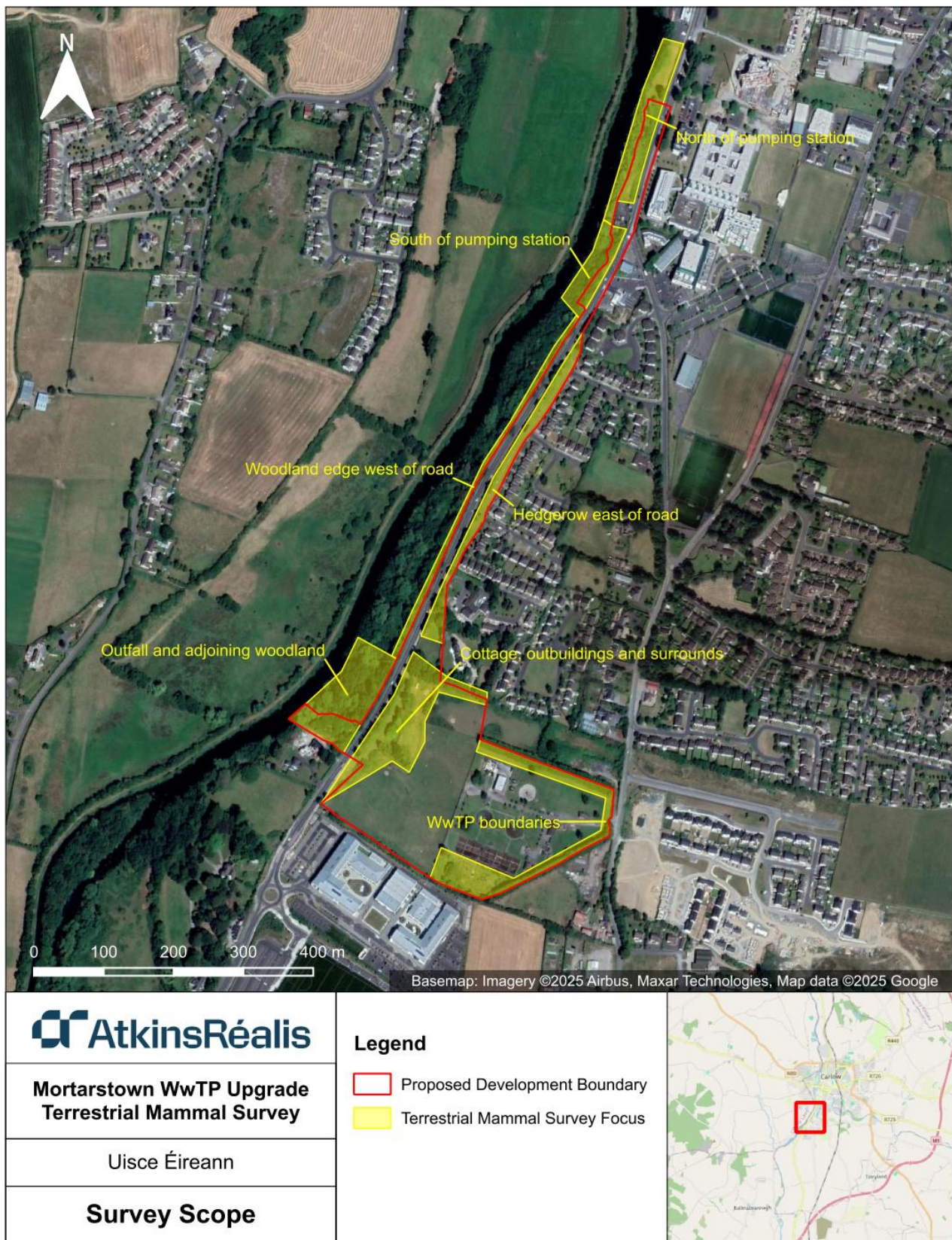


Figure 4-2 - Geographic scope of terrestrial mammal survey.

4.3.4 On-site Meeting with the NPWS

On 21st June 2024, AtkinsRéalis held an on-site consultation meeting with the NPWS and Uisce Éireann. The purpose of this meeting was to brief the NPWS on the current proposals, the ecological constraints identified and how these were proposed to be addressed, and to provide the NPWS with an opportunity to raise any queries or concerns directly with the project team.

4.4 Statement of Authority

This NIS has been prepared by and Owen O’Keefe, peer-reviewed by Kevin McCaffrey and authorised by Fiona Quigley. Niamh Sweeney, Emma Nickelsen and Alec Schmidt contributed to the field surveys.

Owen O’Keefe is a Senior Ecologist at AtkinsRéalis. Owen holds a BSc (Hons) in Ecology from University College Cork (2015) and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has 10 years’ professional experience in ecological consultancy, has carried out a wide range of habitat and species surveys for both large and small infrastructure projects, and has prepared numerous reports for Appropriate Assessment and Environmental Impact Assessment. Owen carried out the 2022/23 site walkover and prepared this NIS, as well as the Biodiversity chapter of the accompanying EIAR.

Niamh Sweeney BSc MSc (Res) is a freshwater ecologist with over 14 years’ professional experience. Niamh has prepared numerous Appropriate Assessment Screening Reports, Natura Impact Statements and Ecological Impact Assessments for private architect firms, waste companies, numerous local authorities, the Office of Public Works and Inland Fisheries Ireland. Niamh carried out the early field surveys for the proposed development.

Emma Nickelsen has a BSc (Hons) in Environmental Biology and an MSc in Marine Biology. Emma has worked in ecological and environmental consultancy since 2017, working on a wide range of projects including bridge works, road construction, local amenity development and renewable energy. A focus of Emma’s work to date has been on preparing Appropriate Assessment Screening Reports, Preliminary Ecological Appraisals and supporting the preparation of Natura Impact Statements and EIARs. Emma assisted in carrying out the early field surveys for the proposed development.

Alec Schmidt is a Graduate Ecologist at AtkinsRéalis, holding a BSc (Hons) in Zoology from University College Cork (2023) and a MSc in Biodiversity and Conservation from Trinity College Dublin (2024). Alec is also a Qualifying Member of the Chartered Institute of Ecology and Environmental Management (QCIEEM). The main focus of Alec’s work involves contributing to ecological surveying and reporting.

Kevin McCaffrey is a Senior Ecologist at AtkinsRéalis and has a BSc (Hons) in Applied Freshwater and Marine Biology and a MSc in Environmental Sustainability, and over 13 years’ experience in freshwater and marine ecology, environmental surveying, impact assessment and as an Ecological Clerk of Works. He has prepared and reviewed a wide range of technical reports, including Ecological Impact Assessments, EIAR Biodiversity chapters and Natura Impact Statements.

Fiona Quigley BE CEng MIEI is a Senior Project Manager at AtkinsRéalis. Fiona was the Project Manager on the main consultant team and authorised this report.

Mary O’Connor carried out the detailed woodland survey and assessment for this project. She has a PhD in plant ecology and over 20 years’ professional experience as an ecologist/environmental scientist. She has worked for public and private sector clients and has several years’ experience of ecological/environmental assessment and input into EIA and AA. She has extensive experience in woodland habitat assessment and has worked as an ecologist in the Irish Forest Service’s Native Woodland Scheme and in the ecological assessment of woodlands for Coillte Teoranta.



5. Receiving Environment

This section provides an overall description of the natural environment in the vicinity of the proposed works and is not limited to Natura 2000 sites.

5.1 General Context

The proposed development is situated on the eastern bank of the River Barrow, on the southern edge of Carlow town. Accordingly, it is surrounded by a mixture of mainly low-density residential and educational land use, with some agricultural use also, and a wooded corridor along the River Barrow. The proposed development is adjacent to the River Barrow, which is designated as part of the River Barrow and River Nore SAC (002162), and includes works to replace the existing outfall to the river.

5.2 Habitats

Following the Fossitt (2000) classification, the habitats found in the vicinity of the proposed development are described in Table 5-1 below and mapped in Figure 5-3 to Figure 5-5. Where relevant, correspondence to natural habitat types listed on Annex I to the Habitats Directive⁷ is also highlighted.

Table 5-1 - Fossitt (2000) habitat types in the study area.

Code	Habitat name	Description
FW2	Depositing/lowland rivers	Adjacent to the proposed development, the River Barrow is a 5 th -order watercourse (<i>EPA Maps: Water</i>), 30-35m wide and 1.2m deep in the margins to >3m in the centre (Triturus, 2025) (see Appendix A.2). The slow, smooth flow type and silted margins are typical of this habitat type. Shade from overhanging trees limits macrophyte growth in the margins to occasional Arrowhead (<i>Sagittaria sagittifolia</i>) and the invasive Nuttall's Waterweed (<i>Elodea nuttallii</i>) (Triturus, 2025). Based on the description and mapping of the Annex I habitat type 'Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation' (3260) in the Article 17 Reports (NPWS, 2025d,e) the River Barrow is taken to represent an example of this Annex I habitat, which is a qualifying interest of the River Barrow and River Nore SAC.
GA1	Improved agricultural grassland	This category covers highly modified or intensively managed agricultural grasslands. In the vicinity of the proposed development, areas of this habitat include the large field immediately west of the existing WwTP (grazed by sheep) and the smaller fields to the north-west (grazed by horses). The vegetation in these areas is largely that described for the Irish Vegetation Classification (IVC) community 'Perennial Rye-grass (<i>Lolium perenne</i>) – White Clover (<i>Trifolium repens</i>) grassland' (GL3B) and does not correspond to any Annex I habitat type.

⁷ Annex I to the Habitats Directive lists natural habitat types which are considered to be of Community interest in the EU and require the establishment of SACs for their protection and the restoration or maintenance of their favourable conservation status. Under Article 17 of the Habitats Directive, Member States are required to monitor the status of these Annex I habitats and report on their conservation status and trends every six years. The latest Article 17 reports for Ireland were published by the NPWS in December 2025.



Code	Habitat name	Description
GA2	Amenity grassland (improved)	Small areas of amenity grassland occur in lawns and public green spaces or landscaped areas around the proposed development. The sward is kept short by regular mowing and herbs such as Daisy (<i>Bellis perennis</i>), Dandelion (<i>Taraxacum</i> spp.), clovers (<i>Trifolium</i> spp.) and plantains (<i>Plantago</i> spp.) are common. The improved amenity grassland within the existing WwTP is included under WD5 below, as trees are a prominent feature. Amenity grassland also occurs intermediate with 'Dry meadows and grassy verges' (see GS2 below) and in a mosaic with 'Buildings and artificial surfaces' (see BL3/GA2 below).
GS2	Dry meadows and grassy verges	This category covers grasslands which are rarely fertilised or grazed, but occasionally mown or treated with herbicide, such as roadside verges and abandoned gardens. Common/typical species include False Oat-grass (<i>Arrhenatherum elatius</i>), Yorkshire Fog (<i>Holcus lanatus</i>), thistles (<i>Cirsium</i> spp.), docks (<i>Rumex</i> spp.), Nettle (<i>Urtica dioica</i>), Ragwort (<i>Jacobaea vulgaris</i>), Winter Heliotrope (<i>Petasites pyrenaicus</i>), Hogweed (<i>Heracleum sphondylium</i>) and Ribwort Plantain (<i>Plantago lanceolata</i>). In the southern corner of the existing WwTP, 'Recolonising bare ground' (ED3) grades to GS2 and this then grades to 'Scrub' (WS1) towards the site boundary. A mosaic of GS2/WS1 also occurs surrounding the cottage west of the WwTP and between the road and the river north of the Kilkenny Road WwPS. On the western side of the Kilkenny Road, parts of the grassy verge are more frequently mown or otherwise more intensively managed, causing them to become intermediate with 'Amenity grassland (improved)' (GA2).
WN*	Semi-natural woodland	The area denoted WN* is a mosaic or continuum of 'Riparian woodland' (WN5), 'Wet willow-alder-ash woodland' (WN6) and 'Mixed broadleaved woodland' (WD1), as detailed in O'Connor (2023) (see Appendix B). The woodland type at any given location within this area is influenced by a combination of vegetation composition, frequency of flooding, soil type and previous management and disturbance and the complex interactions between these factors. The vegetation in the areas which are more representative of WN5 and WN6 corresponds to the IVC community 'Grey Willow (<i>Salix cinerea</i>) – Common Nettle (<i>Urtica dioica</i>) woodland' (WL3D), while the vegetation composition of the areas more representative of WD1 reflects the drier conditions and less frequent flooding, with canopy species such as Horse Chestnut (<i>Aesculus hippocastanum</i>), Poplar (<i>Populus</i> sp.) and Wild Plum (<i>Prunus domestica</i>) replacing the willows (<i>Salix</i> spp.) of the wetter and more frequently flooded areas. Parts of this woodland (as indicated in Figures 4-1 and 4-2 below) correspond to the Annex I priority habitat type '*Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)' (91E0), which is a qualifying interest of the River Barrow and River Nore SAC. The woodland zonation has been defined as follows and illustrated in Figure 5-1 and Figure 5-2: - Zone A, between the river and the 1-in-10-year flood contour (precautionary), represents the priority Annex I alluvial woodland habitat. - Zone B, between the 1-in-10-year and 1-in-100-year flood contours, represents a transitional area with some elements of alluvial woodland, not



Code	Habitat name	Description
		corresponding to the priority Annex I habitat but providing an important supporting function. - Zone C, above the 1-in-100-year flood contour (i.e. only inundated in extreme events), represents a mixed broadleaved woodland with very few elements of alluvial woodland, not corresponding to the priority Annex I habitat and providing only a limited supporting function. - Zone D, immediately south of the existing pumping station, represents immature scrub, not corresponding to the priority Annex I habitat and not providing any supporting function. - Zone E, which is on made ground and almost never inundated, represents willow scrub, not corresponding to the priority Annex I habitat and providing only a limited supporting function, i.e. continuity of woodland canopy and a source of willow regeneration following damage, and much of this zone has recently been cleared.
WD5	Scattered trees and parkland	Areas of the existing WwTP site not taken up with the wastewater infrastructure, buildings and roadways/footpaths are mostly covered by regularly mown amenity grassland with scattered trees and shrubs, the larger and more mature of which include birches (<i>Betula</i> spp.), domestic apples (<i>Malus domestica</i>), Crabapple (<i>Malus sylvestris</i>) and roses (<i>Rosa</i> spp.).
WS1	Scrub	Scrub of different types is present in a number of locations within and adjacent to the red-line boundary of the proposed development. Immediately south of the existing Kilkenny Road WwPS is an area of scrub dominated by Bramble (<i>Rubus fruticosus</i> agg.) with abundant weedy species including Common Nettle, Hedge Bindweed (<i>Calystegia sepium</i>), False Oat-grass (<i>Arrhenatherum elatius</i>), Great Willowherb (<i>Epilobium hirsutum</i>), and some immature willows (<i>Salix</i> spp.) and Sycamore (<i>Acer pseudoplatanus</i>). There is no canopy and very low woody component. On the raised ground near the outfall location, an area of scrub dominated by stunted Grey Willow (<i>Salix cinerea</i>), Elder (<i>Sambucus nigra</i>) and Hazel (<i>Corylus avellana</i>). Recent disturbance in this area has removed much of the herb layer in this area. This area is mapped as zone E in Figure 5-2. This area provides limited supporting function for the adjoining priority Annex I alluvial woodland, i.e. continuity of woodland canopy and a source of willow regeneration following damage. A large stand of the invasive Japanese Knotweed (<i>Reynoutria japonica</i> syn. <i>Fallopia japonica</i>) occurred here previously, but this has been reduced to a small number of plants occurring down-slope from the scrub. Other areas of scrub include the verges and other neglected areas around the remnants of the old Kilkenny Road (now private) which runs in front of the cottage to the west of the WwTP. These areas are dominated by weedy species such as Bramble, Traveller's-joy (<i>Clematis vitalba</i>), Winter Heliotrope and Butterfly-bush (<i>Buddleja davidii</i>).
WL1	Hedgerows	Hedgerows occur along several field and property boundaries around the WwTP site and surrounding areas, and include as their main species Bramble, Ash (<i>Fraxinus excelsior</i>), maples (<i>Acer</i> spp.), Dog-rose (<i>Rosa canina</i>), Hawthorn (<i>Crataegus monogyna</i>), Blackthorn (<i>Prunus spinosa</i>),



Code	Habitat name	Description
		elm (<i>Ulmus</i> sp.) and Ivy (<i>Hedera</i> sp.), among others. The hedgerows mapped as WL1/WL2, i.e. on the eastern side of the Kilkenny Road north of the WwTP, incorporate a significant proportion of trees >5m tall within them, but their overall character remains that of a hedgerow rather than a treeline. Hedgerows are of biodiversity value as nesting habitat for birds and a food source for birds and invertebrates, and also provide connectivity between other habitats in the landscape.
WL2	Treelines	North and west of the WwTP, where the new WwPS is proposed, there are mature treelines of Sycamore and Birch, as well as mature conifers. Along the northern and south-eastern boundary of the existing WwTP site, there is a treeline of mature Leyland Cypress (<i>Cupressus × leylandii</i>) with occasional ornamental maples.
ED2	Spoil and bare ground	These are areas of bare ground or unconsolidated material that are kept largely clear of vegetation (at least 50% of the area is free of vegetation) due to recent or regular disturbance.
ED3	Recolonising bare ground	This category includes areas of previously bare or disturbed ground which is being recolonised by vegetation (at least 50% of the area is vegetated). Species commonly observed in these areas in the vicinity of the proposed development included willowherbs (<i>Epilobium</i> spp.), Greater Plantain (<i>Plantago major</i>), Knotgrass (<i>Polygonum aviculare</i>) and Shepherd's-purse (<i>Capsella bursa-pastoris</i>).
BC3	Tilled land	During the surveys which informed the habitat mapping, a field to the south of the existing WwTP site had been tilled in preparation for planting of crops.
BL1	Stone walls and other stonework	An old stone wall occurs on the eastern boundary of the existing Kilkenny Road WwPS and continues south for c. 125m along the road. This wall is relatively well maintained and pointed and, consequently, supports only common species of this habitat, including spleenworts (<i>Asplenium</i> spp.), Herb-Robert (<i>Geranium robertianum</i>), Navelwort (<i>Umbilicus rupestris</i>), Ivy, Ivy-leaved Toadflax (<i>Cymbalaria muralis</i>) and Red Valerian (<i>Centranthus ruber</i>).
BL3	Buildings and artificial surfaces	This category includes all of the roads, footpaths, areas of hardstanding, buildings (regardless of use) and other structures within and adjoining the red-line boundary of the proposed development.
BL3/GA2	Buildings and gardens	Buildings such as domestic dwellings and their associated landscaped areas or gardens are mapped as a mosaic of primarily BL3 and GA2. These also frequently contain areas of 'Ornamental/non-native shrub' (WS3), 'Horticultural land' (BC2), 'Flower beds and borders' (BC4) and 'Stone walls and other stonework' (BL1). Many species, particularly shrubs, from gardens and landscaping have escaped into the surrounding area and become established.

Other than the river and alluvial woodland described above, are no Annex I habitats within or near the proposed development footprint.





Figure 5-1 - South of existing pumping station, illustrating the extents of zones A-D described in Table 5-1. Source: Figure 3 in O'Connor (2023); see Appendix B.



Figure 5-2 - Vicinity of outfall pipe, illustrating the extents of zones A and E described in Table 5-1. Source: Figure 4 in O'Connor (2023); see Appendix B.

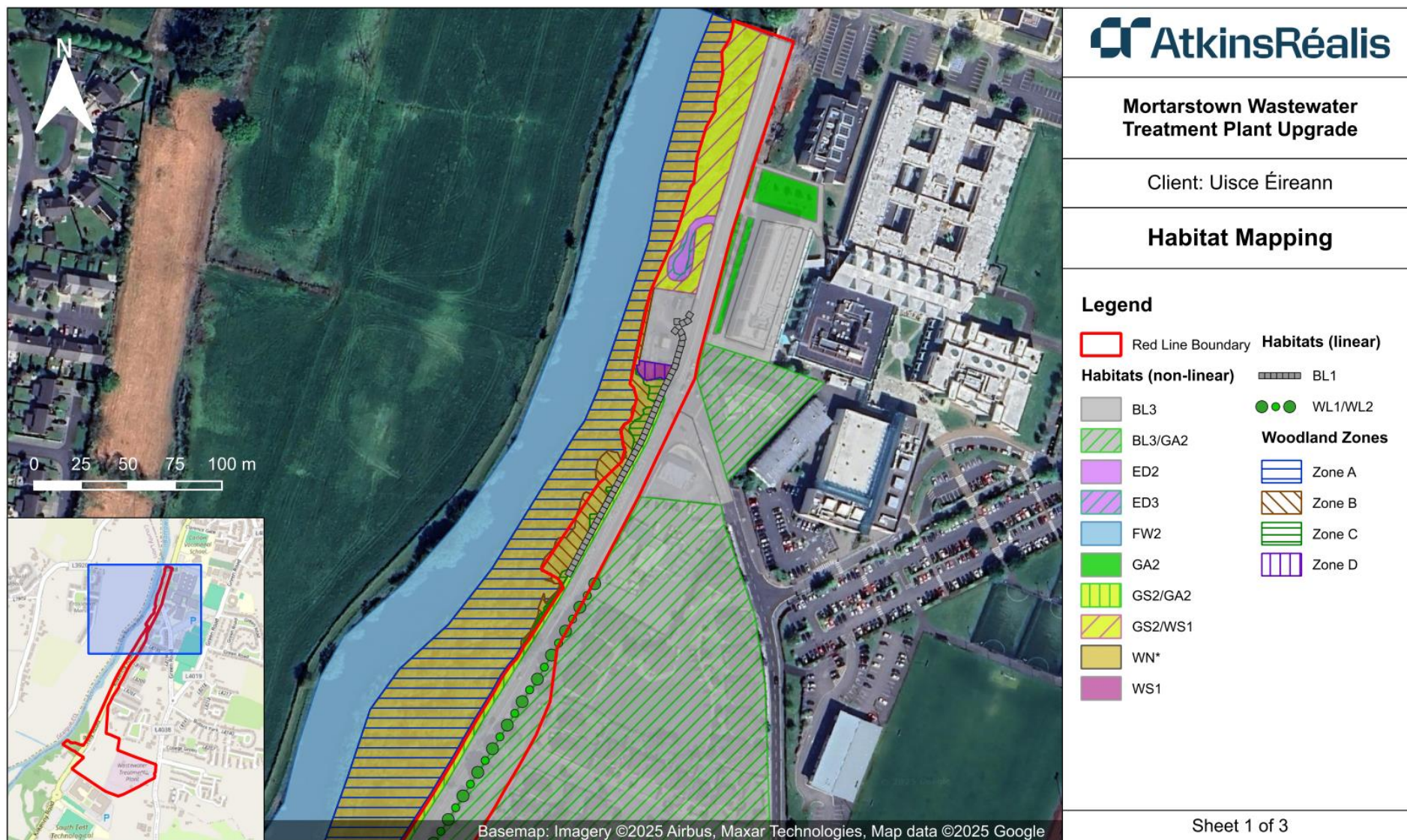


Figure 5-3 - Habitat mapping following the Fossitt (2000) classification. Sheet 1 of 3.



Figure 5-4 - Habitat mapping following the Fossitt (2000) classification. Sheet 2 of 3.





Figure 5-5 - Habitat mapping following the Fossitt (2000) classification. Sheet 3 of 3.

5.3 Protected and Threatened Species

5.3.1 Flora

1 no. plant species is listed as a qualifying interest of the River Barrow and River Nore SAC, namely Killarney Fern (*Vandenboschia speciosa*). No other vascular plants or any bryophytes are listed as qualifying interests of this site.

The vascular plant and bryophyte species protected under the Wildlife Act⁸ are listed in the Flora Protection Order (FPO)⁹. The national conservation status of floral species are assessed in the Irish Red Lists of Vascular Plants¹⁰ and Bryophytes¹¹.

Based on NPWS Data Request No. 2025_133 and the *FPO (Vascular Plants) Map Viewer*¹², the following 2 no. species listed on the FPO have been recorded in hectad S77:

- Meadow Saffron (*Colchicum autumnale*), which is listed as 'Endangered' in the Irish Red List of Vascular Plants, was recorded south of Carlow town in 1836.
- Red Hemp-nettle (*Galeopsis angustifolia*), which is listed as 'Vulnerable' in the Irish Red List of Vascular Plants, was recorded north of Carlow town in 1898.

In addition, the following 2 no. species have also been recorded in hectad S77:

- Basil Thyme (*Clinopodium acinos*), which is listed as 'Near Threatened' in the Irish Red List of Vascular Plants, was recorded south of Carlow town in 1898.
- Henbane (*Hyoscyamus niger*), which is listed as 'Near Threatened' in the Irish Red List of Vascular Plants, was recorded at Browne's Hill (east of Carlow town) in 1866.

Only the records for Meadow Saffron and Basil Thyme are potentially in close proximity to the proposed development, i.e. "south of Carlow town". It should be noted that both of these records are pre-1900.

No records of protected or threatened bryophytes were found in NPWS Data Request No. 2025_133 or on the *FPO (Bryophytes) Map Viewer*¹³. The search of the NBDC database (see geographic extent in Figure 4-1 above) did not return any records of protected or threatened vascular plants or bryophytes. None of the floral species observed during the field surveys are listed on the FPO or assessed as greater than 'Least Concern' in the relevant Irish Red List.

⁸ Wildlife Act, 1976. No. 39 of 1976. Updated to 16 May 2024 (<https://revisedacts.lawreform.ie/eli/1976/act/39/revised/en/html>) [accessed 01/08/2025]. Law Reform Commission.

⁹ Flora (Protection) Order, 2022. SI No. 235/2022.

¹⁰ Wyse Jackson et al. (2016). *Ireland Red List No. 10: Vascular Plants*. NPWS.

¹¹ Hodgetts & Lockhart (2025). *Ireland Red List No. 14: Bryophytes (Mosses, Liverworts & Hornworts)*. NPWS.

¹² *Flora (Protection) Order 2022 Map Viewer* (<https://heritagedata.maps.arcgis.com/apps/webappviewer/index.html?id=a41ef4e10227499d8de17a8abe42bd1e>) [accessed 10/09/2025]. NPWS

¹³ *FPO Bryophytes* (<https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e>) [accessed 10/09/2025]. NPWS.



On the basis of the above results of the desk study and field surveys with regard to protected and threatened flora, such species are not considered to be a key consideration in the NIS.

5.3.2 Non-volant Mammals

1 no. non-volant mammal species is listed as a qualifying interest of the River Barrow and River Nore SAC, namely Otter (*Lutra lutra*). No bat species are listed as qualifying interests.

Table 5-2 below lists the non-volant mammal species for which records were retrieved from NBDC *Biodiversity Maps* and NPWS Data Request No. 2025_133. In this table, WA = Wildlife Act; IRL = Irish Red List, LC = Least Concern, NA = Not Assessed; HD = Habitats Directive, II/IV/V = Annex II/IV/V.

Table 5-2 - Non-volant mammals recorded overlapping the proposed development (excluding invasive non-native species). Source: NBDC *Biodiversity Maps* and NPWS Data Request No. 2025_133.

Common name	Scientific name	Designation
Otter	<i>Lutra lutra</i>	WA; HD-II,IV; IRL-LC
Irish Hare	<i>Lepus timidus</i> subsp. <i>hibernicus</i>	WA; HD-V; IRL-LC
Pine Marten	<i>Martes martes</i>	WA; HD-V; IRL-LC
Red Deer	<i>Cervus elaphus</i>	WA; IRL-LC
Hedgehog	<i>Erinaceus europaeus</i>	WA; IRL-LC
Badger	<i>Meles meles</i>	WA; IRL-LC
Irish Stoat	<i>Mustela erminea</i> subsp. <i>hibernica</i>	WA; IRL-LC

A mammal burrow in the vicinity of the outfall was investigated by Sweeney (2021) as a potential Otter holt. No otters were recorded entering or exiting the burrow, while a Pine Marten and a Red Fox (*Vulpes vulpes*) were seen outside it (Red Fox is not a protected species). During field surveys by AtkinsRéalis in 2025, the burrow identified in 2021 was no longer present (it was likely lost to reprofiling of the slope of the made ground at this location).

The field surveys by AtkinsRéalis in 2025 did, however, confirm the presence of Otter in the vicinity of the proposed development. Otter is also listed on Annex IV to the Habitats Directive, affording strict protection to this species and its breeding and resting places. In the latest Article 17 species assessment report (NPWS, 2025f), the conservation status of Otter is assessed as 'Favourable' and 'stable'. While Otter commuting and regular sprainting sites were identified, a thorough search found no potential holts.

The results of the 2025 non-volant mammal surveys are as follows:

- Other than along the riverbank and around the uninhabited cottage between the WwTP and the Kilkenny Road, there was no evidence of breeding or resting places of non-volant mammals.
- Behind the cottage and outbuildings, there was evidence of burrows of Rabbit and likely Red Fox. One entrance appeared more like that of Badger, but there was no evidence of recent use. This area may be a former annex Badger sett which has been taken over by Rabbits and possibly Fox. The trail camera monitoring at this location recorded Red Fox on 6 no. of the 14 no. nights from 27th March to 10th April. No other mammals were recorded on this camera. On at least one occasion, the same individual was identifiable on both cameras.



- There was much evidence of mammal activity along the riverbank at and upstream of the outfall location, including Otter spraints, slides and possible couches. Prints in the mud also show evidence of foxes, rats and potentially other mammals. The trail camera monitoring at this location recorded Otter on 8 no. of the 14 no. nights from 27th March to 10th April, confirming regular use of this area by this species. On a number of occasions, 2 no. individuals were seen in the same recording. Other species recorded on this camera included Red Fox, Brown Rat, a domestic cat and several bird species, including Grey Heron.
- The sloped ground around the existing and proposed outfall locations was thoroughly searched. There was very little evidence of mammals using this area and there were no holes/burrows large enough to be used by Otter or even Rabbit. This area is highly disturbed and the ground is full of refuse and rubble, making it very difficult for Otter or other mammals to burrow here.
- Around the existing WwPS, there was some evidence of Otter activity, but not as intensive as observed along the riverbank in the southern part of the woodland, and there were no signs of any holts.

Other non-volant mammals protected under the Wildlife Act which may use the habitats found in the vicinity of the proposed development include: Hedgehog (*Erinaceus europaeus*), Irish Hare (*Lepus timidus* subsp. *hibernicus*), Badger (*Meles meles*), Irish Stoat (*Mustela erminea* subsp. *hibernica*), Red Squirrel (*Sciurus vulgaris*) and Pygmy Shrew (*Sorex minutus*). However, limited evidence of these mobile species was observed during field surveys.

Given that Otter, a strictly protected species and a qualifying interest of the River Barrow and River Nore SAC, regularly occurs in close proximity to the proposed development and is sensitive to disturbance and other impacts, this species is considered to be a key consideration in the NIS.

5.3.3 Fish Species

5 no. fish species are listed as qualifying interests of the River Barrow and River Nore SAC, namely Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Alosa fallax fallax*) and Salmon (*Salmo salar*).

No fish records were returned from either the NBDC or NPWS databases. However, IFI has recently made Water Framework Directive (WFD) fish sampling records available via an online GIS platform¹⁴ and this was reviewed to gather the fish data shown in Table 5-3 below.

Most of the species recorded are non-native and some are considered to be invasive, e.g. Dace (*Leuciscus leuciscus*) and Roach (*Rutilus rutilus*).¹⁵ The status of Pike (*Esox lucius*) as a native or non-native species is debated. European Eel (*Anguilla anguilla*) is assessed as 'Critically Endangered' both in Ireland and globally.

Table 5-3 - Records from WFD Fish Sampling. Location is relative to the proposed development.

Source: IFI Open Data.

Location	Year	WFD Fish Status	Species
c. 2.8km upstream	2015	'Poor'	Dace, Gudgeon (<i>Gobio gobio</i>), Minnow (<i>Phoxinus phoxinus</i>), Perch (<i>Perca fluviatilis</i>), Pike and Roach

¹⁴ IFI Open Data: Water Framework Directive Rivers Fish Ecological Status 2008 to recent (https://opendata-ifigeo.hub.arcgis.com/datasets/649f3be078b04317896547bd517bfda0_0/explore) [accessed 12/09/2025]. IFI.

¹⁵ King et al. (2011). *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*. NPWS.



Location	Year	WFD Fish Status	Species
c. 2.5km upstream	2015	'Poor'	Dace, Perch, Roach
c. 2.5km upstream	2021	'Moderate'	Dace, Gudgeon, Minnow, Perch, Pike, Roach and Roach-Bream hybrid (<i>Rutilus rutilus</i> × <i>Abramis brama</i>)
c. 2.3km downstream	2015	'Moderate'	Dace, Gudgeon, Minnow, Perch, Pike, Roach and Stone Loach (<i>Barbatula barbatula</i>)
c. 2.6km downstream	2015	'Moderate'	Dace, Gudgeon, Minnow, Perch, Roach and Stone Loach
c. 2.6km downstream	2021	'Poor'	Dace, European Eel, Perch and Roach

Fisheries surveys by Triturus (2021) recorded 11 no. Minnow, 3 no. Brook/River Lamprey (*Lampetra* sp.) ammocoetes and 1 no. stickleback (*Gasterosteus* sp.) in the sample sites near the outfall. In the same locations, Triturus (2025) recorded 21 no. Minnow, 12 no. Dace and 5 no. Three-spined Stickleback (*G. aculeatus*). No lampreys were recorded in 2025. The increase in the numbers of cyprinid fish from 2021 to 2025 is likely associated with the reduced flows and increase in cover of the invasive Nuttall's Waterweed (*Elodea nuttallii*).

Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*) and River Lamprey (*L. fluviatilis*) have all been recorded in the River Barrow historically. However, as explained in Triturus (2025) (see Appendix A.2 to this EIAR), the main channel of the river is generally poor in terms of spawning and nursery habitat. While no suitable spawning or nursery habitat occurs in the vicinity of the proposed development, lamprey are likely to move past this location on their migrations.

Salmon (*Salmo salar*) also occurs throughout the River Barrow catchment. While the aquatic habitat in the vicinity of the proposed development is of poor quality for adult and juvenile salmon, salmon are likely to move past this location when on migration or otherwise moving between areas of more suitable habitat.

Given all of the above, fish are considered to be a key consideration in the NIS.

5.3.4 Crayfish

White-clawed Crayfish (*Austropotamobius pallipes*) is known to occur throughout the River Barrow and several of its tributaries, the nearest record being c. 200m downstream of the proposed development (NPWS Data Request No. 2025_133). This species is protected under the Wildlife Act and listed on Annex II to the Habitats Directive. It is a qualifying interest of the River Barrow and River Nore SAC. The Article 17 assessment of the conservation status of White-clawed Crayfish in 2025 was 'Bad' and 'deteriorating'.

An outbreak of aphanomycosis or "crayfish plague" occurred in the River Barrow in 2017. This disease is caused by the oomycete or "water mould" pathogen *Aphanomyces astaci* and leads to 100% mortality in the infected populations of White-clawed Crayfish. No crayfish were encountered during the Triturus (2025) aquatic surveys.

While it is unlikely that White-clawed Crayfish occurs in the vicinity of the proposed works, its presence cannot be ruled out entirely. Given the previous likely presence of this species (pre-2017), which is a qualifying interest of the River Barrow and River Nore SAC, and the need for in-stream works for the construction of the proposed development, it is considered prudent to include it as a key consideration in the NIS.



5.4 Invasive Non-native Species

Invasive non-native species are species which are caused to spread outside their natural range due to human activities and become problematic in their new habitats. Such species can have significant negative effects on biodiversity and related ecosystem services, human health and safety, and the economy. *Ireland's invasive and non-native species – trends in introductions* (O'Flynn *et al.*, 2014) presented a risk assessment of 377 no. recorded non-native species and 342 no. non-native potential invaders and categorised them as 'High-impact', 'Medium-impact' and 'Low-impact' species, according to their environmental, social and economic impacts.

The Third Schedule to the Habitats Regulations lists invasive non-native species requiring legal restrictions to prevent their spread. Regulation 49(2) and (3) of the Habitats Regulations make it an offence to cause or allow the spread of any of these species (or their hybrids, cultivars etc.), except where all reasonable steps have been taken and due diligence exercised to avoid committing the offence. As such, these species are of particular concern with regard to site development and construction works.

In addition, the EU Invasive Alien Species Regulation¹⁶ establishes rules to prevent, minimise and mitigate the negative effects of IAS within the EU. The species to which this Regulation applies are included in the official *List of Invasive Alien Species of Union concern*¹⁷. Given the environmental, social and economic effects of these species and the legal restrictions on them at an EU level, they are also of concern for planning and development.

Four legally restricted invasive non-native plant species were recorded in the vicinity of the proposed development during the field surveys:

- A small stand of Japanese Knotweed (*Reynoutria japonica* syn. *Fallopia japonica*) is present in the vicinity of the existing and proposed outfalls to the River Barrow. This stand is located where an area of disturbed ground meets the riparian woodland and is subject to ongoing monitoring and control (INVAS, 2025, 2026). This is a 'High-impact' invasive species and is listed on the Third Schedule to the Habitats Regulations.
- Himalayan Balsam (*Impatiens glandulifera*) is more widespread in the riparian zone and in frequently flooded areas, including near the outfall location and the existing WwPS. The balsam stands in the study area likely form part of a much larger population extending along the banks of the River Barrow and its tributaries (INVAS, 2026). This is a 'High-impact' invasive species and is listed on both the Third Schedule to the Habitats Regulations and the *List of Invasive Alien Species of Union concern*.
- Three-cornered Leek (*Allium triquetrum*) occurs along the eastern edge of the Kilkenny Road and adjoining hedgerow/treeline in the vicinity of the proposed development (INVAS, 2026). This is a 'Medium-impact' invasive species and is listed on the Third Schedule to the Habitats Regulations.
- Nuttall's Waterweed (*Elodea nuttallii*) occurs within the River Barrow in the vicinity of the existing and proposed outfall (Triturus, 2025). This is a 'High-impact' invasive species and is listed on both the Third Schedule to the Habitats Regulations and the *List of Invasive Alien Species of Union concern*.

Other non-native and invasive plant species found in the vicinity of the proposed development during the field surveys, but which are not subject to legal restrictions, include Traveller's-joy (*Clematis vitalba*), Snowberry (*Symphoricarpos albus*), Winter Heliotrope (*Petasites pyrenaicus*), Butterfly-bush (*Buddleja davidii*), Sycamore

¹⁶ Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species. *Official Journal of the European Union* L 317/35-55.

¹⁷ *List of Invasive Alien Species of Union concern* (unofficial consolidation) (<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02016R1141-20250807>) [accessed 11/09/2025]. DG Env.

(*Acer pseudoplatanus*) and Cherry Laurel (*Prunus laurocerasus*). These are predominantly 'Medium-impact' species.

A number of additional invasive non-native species were identified in the desk study but not recorded during the field surveys. These are listed in Table 5-4 below.

Table 5-4 - Additional invasive non-native species identified in the desk study but not recorded during the field surveys. Source: NBDC Biodiversity Maps and NPWS Data Request No. 2025_133.

Common name	Scientific name	Designation
Giant Hogweed	<i>Heracleum mantegazzianum</i>	High-impact; HR-3; EU-IAS
Water Fern	<i>Azolla filiculoides</i>	Medium-impact; HR-3
Canadian Waterweed	<i>Elodea canadensis</i>	High-impact
Freshwater shrimp	<i>Gammarus pulex</i>	Medium-impact
Jenkins' Spire Snail	<i>Potamopyrgus antipodarum</i>	Medium-impact
Canada Goose	<i>Branta canadensis</i>	High-impact; HR-3
Sika Deer	<i>Cervus nippon</i>	WA; High-impact; HR-3
American Mink	<i>Neovison vison</i>	High-impact; HR-3
Greater White-toothed Shrew	<i>Crocidura russula</i>	Medium-impact

Given the presence of legally restricted invasive non-native species within the footprint of the proposed development and the ecological and legal risks associated with working in close proximity to these species, they are considered to be a key consideration in the NIS.



6. Potential Impacts

This section describes the types of impacts likely to arise during the construction and operation of the proposed development. This information is used to establish the Zone of Influence and identify the Natura 2000 sites and qualifying interests therein in Section 6.8. Analysis and evaluation of effects specific to the qualifying interests of the Natura 2000 sites concerned is provided in Section 8.

6.1 Habitat Loss and Fragmentation

The expansion of the footprint of the wastewater and ancillary infrastructure necessitates the permanent removal of some habitats, while construction activities will require the temporary use of additional areas.

The effects of these impacts include reductions in the area and distribution of the habitats themselves, as well as reduced habitat connectivity and quality in the wider area. Habitat loss can also lead to changes in adjoining habitats via edge effects. These impacts can also lead to negative impacts on fauna, such as loss of forage, cover or breeding and resting places at a local level, restriction of feeding ranges, and reduced gene flow at the population level.

The significance of these effects depends on their extent, the availability of alternative habitats (with connectivity) and the capacity of the habitats for recovery or regeneration (in the case of areas required temporarily).

6.2 Disturbance to Fauna

Disturbance can stimulate different responses from fauna, from heightened vigilance (refocussing energy from feeding or breeding-related activities to active awareness of threats) to avoidance (physically moving away from the stimulus). These responses cause physiological stress, which affects the energy budgets of the species concerned. At the upper end of the scale, avoidance can lead to the displacement of species from the area, which reduces their access to feeding, breeding or resting habitats. This can also represent an effective barrier to connectivity where the affected area crosses a commuting corridor, e.g. a hedgerow. When the impacts persist over a critical timeframe, survival and breeding success can fall. As such, the degree to which a receptor is affected depends on the intensity of the disturbance at its source, the duration of the disturbance, the sensitivities of the receptors and availability of suitable alternative habitats and commuting corridors.

Construction Phase

During the construction phase, the physical presence, movement, sound and vibration from vehicles, machinery and personnel will give rise to some disturbance to fauna, particularly mammals and birds. Given the nature of the construction activities, the impacts are likely to be moderate-intensity but very localised, with any noise and vibration unlikely to affect fauna beyond c. 100m from active works. The affected area for visual disturbance to fauna is very variable depending on the sensitivities of the species concerned and presence of existing screening in the form of vegetation or structures to be retained during construction.

The overall duration of the construction phase is expected to be c. 30 months and the duration of high-intensity works at any one location will likely be significantly less than this. Works relating to construction of the new outfall are expected to take c. 3 weeks to complete (cofferdam installation/removal, formation/foundation works, headwall installation and backfilling). As works will be undertaken during normal working hours (08:00 to 18:00), disturbance will be focussed outside of the hours of greatest sensitivities of mammals in the study area, which are predominantly nocturnal.



Operational Phase

Disturbance during the operational phase will be limited to the typical operational activities of a WwTP within the main campus, and periodic maintenance at the outfall and other chamber/manhole locations. Disturbance from these activities is considered to be low-intensity and also very localised (within c. 50m). Any disturbance from the operation of the proposed development is likely to be imperceptible above baseline levels.

6.3 Artificial Lighting

As natural systems, from single cells to whole ecosystems, rely on day/night length as cues for their time-based (daily, monthly and annual) cycles, artificial lighting at night is recognised as a major disruptor of these cycles, with negative effects for the species and ecosystems concerned. Nocturnal and crepuscular mammals such as bats and Otter are particularly sensitive to such impacts, both directly (due to shifts in their hours of activity and avoidance of lit areas) and indirectly (due to changes in the behaviour of their prey). The significance of the effects of artificial lighting depends of factors such as the proximity to sensitive receptors, the intensity and wavelength of light emitted, and the hours during which the lights are on.

6.4 Underwater Noise and Vibration

The installation of the new outfall to the River Barrow will require a temporary cofferdam to enable the works area to be isolated from the river and carried out in the dry. The cofferdam will be formed by sheet piles installed by a piling rig or excavator with piling attachment on a jack-up barge in the river. Piling is the only construction activity that will give rise to any significant underwater noise or vibration. Species at risk include fish and otters.

Wave Dynamics (2026)¹⁸ (see Appendix I to this NIS) modelled the underwater noise predicted to arise from piling for the cofferdam and evaluated it against recognised impact thresholds for the most sensitive receptors (juvenile fish of species with specialised acoustic organs). This assessment found that, even in the worst-case scenario (impact/percussive pile driving), these receptors would only experience temporary hearing injury if they remain within 12m of active piling for at least 10 minutes, while behavioural responses could be induced up to 700m from the activity.

Therefore, the significance of effects of underwater noise will depend on the timing (seasonal) and pattern of repetition of the impact. No such impacts will occur during the operational phase.

6.5 Impacts on Water Quality

6.5.1 Construction Phase

Water quality impacts that can arise from construction activities include pollution from the following sources, which can affect both surface waters and groundwater:

- Sediment from excavations, earthworks and dewatering,

¹⁸ Wave Dynamics (2026). *Mortarstown WWTP Underwater Noise Impact Assessment*. WDA240906 RP_B_01. February 2026. Wave Dynamics Ltd for Uisce Éireann.



- Hydrocarbons (e.g. diesel, hydraulic oils and lubricating oils) from vehicles, plant and equipment, including the jack-up barge to be used for installation of the temporary cofferdam at the outfall location,
- Cementitious materials (e.g. concrete) from batching of wet concrete and washing out of concrete transport and placement machinery,
- Effluent from on-site temporary wastewater treatment systems, e.g. welfare units, and
- Drilling fluid and/or other deleterious matter from fracture blow-out during tunnelling works.

Such impacts can have negative effects on aquatic habitats and species, the significance of which depends on the nature, magnitude, extent and timing of the pollution event. In general, any water quality impacts associated with the construction of the proposed development are likely to be moderate, localised and limited to the duration of the proposed development. While the outfall works (in-stream works) and any accidental spills of hydrocarbons pose a risk more significant impacts, these works are also more limited in terms of their scale and duration.

6.5.2 Operational Phase

The proposed development will provide additional wastewater treatment capacity at the Mortarstown WwTP. The current collected load at the WwTP is population equivalent (p.e.) 39,270, which is above the existing design p.e. of 36,000. The proposed design capacity is p.e. 58,500 (for design year 2052). The operation of the proposed development does not involve any permanent loss or alteration of riparian habitat, and is expected to lead to an improvement in water quality, including fewer and smaller overflow events, until at least the design year.

A Wastewater Assimilative Capacity (WAC) Assessment Report (see Appendix E to this NIS) has been prepared for the proposed development to inform the setting of emission limit values (ELVs) for the upgraded WwTP. Compliance with these ELVs will ensure that the discharge from the WwTP will not lead to exceedance of the environmental quality standards (EQSs) for the River Barrow.¹⁹

Based on an assessment of the environmental sensitivity of the receiving waterbody, i.e. the River Barrow, including the River Barrow and River Nore SAC, and an examination of a the various water quality parameters of the existing effluent, it was found that ammonia, biological oxygen demand (BOD) and orthophosphates were of concern, as their concentrations in the WwTP effluent exceeded both the EQS and ambient concentrations.

River water quality is monitored at sampling points RS14B012310, at Graiguecullen Bridge, c. 1.8km upstream of the primary outfall and RS14B012460, at Dolmen Mews, c. 1.0km downstream of this outfall. The following is noted with respect to the differences between upstream and downstream ambient concentrations for ammonia, BOD and orthophosphates (with reference to Table 6-1 below):

- Both the mean and 95%ile concentrations of ammonia are in the upper 25% of the 'Good' status EQS band at the upstream monitoring point and exceed the 'Good' status EQS thresholds at the downstream point.
- Both mean and 95%ile BOD exceed the 'Good' status EQS thresholds at both the upstream and downstream monitoring points. The increases in BOD between the upstream to downstream sampling points is 0.022mg/l (mean), which is 1.2% of the upstream concentration or 1.5% of the 'Good' status EQS, and 0.179mg/l

¹⁹ The EQSs have been set as a basis for the achievement of the Water Framework Directive (WFD) objectives for the waterbody in question. The objective for the River Barrow is to achieve 'Good' status, which in turn supports the conservation of the aquatic habitats and species that depend on the river, including the qualifying interests of the River Barrow and River Nore SAC.



(95%ile), which is 4.4% of the upstream concentration or 6.9% of the 'Good' status EQS, i.e. no significant increase.

- Mean ambient concentrations of orthophosphates are within the 'High' status EQS threshold both upstream and downstream, while the 95%ile concentrations (both upstream and downstream) are within the 'Good' status EQS band.
- The WAC Assessment Report in Appendix E to this NIS established that the exceedances of the 'Good' status EQS thresholds for ammonia and BOD are due to upstream catchment pressures on water quality.

Table 6-1 - Existing concentrations of pollutants of concern at Mortarstown (Table 4-2 of the WAC report). Green shading indicates concentrations within the EQS for 'Good' status, while orange indicates exceedance; blue indicates 'High' status.

Substance	RS14B012310 (Upstream)		RS14B012460 (Downstream)	
	Mean	95%ile	Mean	95%ile
Ammonia (mg/l)	0.063	0.139	0.069	0.202
BOD (mg/l)	1.805	4.100	1.827	4.279
Orthophosphate (mg/l)	0.020	0.049	0.021	0.058

The available WAC of the receiving waterbody is the difference between the upstream ambient concentrations of a given substance and the EQS for that substance, assuming that the latter is greater. At Mortarstown, the upstream ambient concentrations of ammonia are in the upper 25% of the 'Good' status EQS bands (and exceed the 'Good' status EQS thresholds downstream) and the upstream and downstream ambient BOD exceed the 'Good' status EQS threshold. As such, ELVs cannot be set for effluent from the upgraded WwTP which would secure compliance with 'Good' status at the downstream point. Therefore, following Uisce Éireann's standard methodology (see Figure 2-1 of the WAC Assessment Report in Appendix E to this NIS), the assessment and setting of ELVs is carried out on the basis of a "notionally clean" condition for ammonia and BOD, i.e. ambient value simulated as 20% of EQS for 'High' status.

The ELVs represent the concentrations of each substance in WwTP effluent (for the design flow at p.e. 58,500) that will take up no more than 30% of the available WAC, i.e. effluent concentrations that will not lead to exceedance of the relevant EQS.

The WAC Assessment Report recommended that the ELVs for the Discharge Licence for the upgraded WwTP be set as follows, with comparison to the current Discharge Licence for the existing WwTP:

- Ammonia: 2.0mg/l, no change.²⁰
- BOD: 25mg/l, increased from current 15mg/l.²¹

²⁰ The ELV calculated based on the "notionally clean" condition was 2.4mg/l. However, the ELV will be set at 2.0mg/l to align with the existing Discharge Licence. This will allow for sustainable future operation of the wastewater infrastructure in line with the "polluter-pays" principle under the WFD, while still ensuring that there will be no deterioration in ambient water quality in terms of ammonia.

²¹ The ELV calculated based on the "notionally clean" condition was 42.5mg/l. However, the maximum permitted ELV for BOD under the Urban Wastewater Treatment Directive is 25mg/l. As such, the ELV will be set at 25mg/l. This will allow for sustainable future operation of the wastewater infrastructure in line with the "polluter-pays" principle, while still ensuring that the discharge does not contribute significantly to the baseline exceedance of the EQS for BOD.



- Orthophosphates: 1.0mg/l, no change.

The proposed development has been designed to operate within these ELVs and will be required to do so under the terms and conditions of its new Discharge Licence. As such, any impacts on water quality will be imperceptible and limited to the locality of the discharge, with no impacts on the downstream estuarine and coastal waters.

A standalone assessment of the implications of the proposed development for the Water Framework Directive (WFD) quality status and objectives for the receiving waterbodies was carried out by Hydro Environmental Services Ltd. This assessment concluded that the proposed development:

- *“will not cause a deterioration in the status of all surface and groundwater bodies assessed;*
- *will not jeopardise the objectives to achieve ‘Good’ surface water/groundwater status;*
- *does not jeopardise the attainment of ‘Good’ surface water/groundwater chemical status;*
- *does not jeopardise the attainment of ‘Good’ surface water/groundwater quantity status;*
- *does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district;*
- *is compliant with the requirements of the Water Framework Directive (2000/60/EC); and,*
- *is consistent with other Community Environmental Legislation including the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC).”*

In addition to the above, the increased capacity of the new gravity sewer and WwPS that will replace the existing Kilkenny Road WwTP, and the increased storm water storage and treatment capacity at the upgraded WwTP, there will be a decrease in the frequency and volume of overflows of untreated wastewater and surface water to the River Barrow during high rainfall events. This positive effect will be significant in the short term, but will decrease over time as more of the unused capacity is taken up by urban development in the wastewater agglomeration and the intensity of rainfall events likely increases due to the effects of climate change.

On the basis of the above assessments and from the perspective of Biodiversity, the overall effect of the operation of the proposed development on water quality in the River Barrow is likely to be positive and slight in the short term to imperceptible in the long term.

Chapter 12 Water of the EIAR for the proposed development (which is submitted alongside this NIS) also identifies a risk of water quality impacts in the event of a leak or other failure of the wastewater infrastructure. However, it has assessed such impacts as “imperceptible” and “unlikely”.

6.6 Hydrological Regime and Hydromorphology

The presence of structures within a river channel displaces flows, leading to changes in water levels and flow velocities elsewhere in the channel, which can in turn lead to changes in patterns of erosion, transport and deposition of river substrate or bank material. In the case of the proposed development, the new headwall at the outfall point is an in-channel structure, and the cofferdam that will be in place during construction represents a more significant one.



Modelling in the *Hydrodynamic Technical Report* (presented in Appendix F to this NIS)²² predicted the effects of the presence of the headwall and cofferdam on water levels and flow velocities in the River Barrow under different scenarios of flow conditions and climate change. For the operational phase (headwall only), modelling predicted no perceptible change to water levels or flow velocities under any scenario. For the construction phase, however, there were some changes likely due to the presence of the temporary cofferdam.

In the very worst-case scenario (cofferdam in place, 5%ile flow + climate change), the modelling predicted maximum increases in flow velocity of 0.14-0.16m/s on the right bank of the river, while in parts of the channel velocities are unaffected or reduced, as illustrated in Figure 6-1 below. The mean change over this cross-section is +0.03m/s, as shown in Table 23 in Appendix F. All changes in flow velocities are limited to within 40m upstream and 70m downstream of the outfall works. In the same scenario, the upstream water level was predicted to increase by c. 1cm and the downstream water level was predicted to decrease by c. 1cm (changes restricted to within c. 100m of the outfall works).

In the case of the 50%ile flow, with or without consideration of climate change, no change was predicted to water levels or flow velocities due to the presence of the cofferdam.

Based on the modelling in the *Hydrodynamic Technical Report*, it is considered that there will be:

- No changes to water levels that would affect the hydrological regime in any habitat, and
- No changes to flow velocities that would
 - Affect patterns of erosion, transport and deposition of the river substrate or bank material, or
 - Impede the upstream movement of fish, otters, crayfish or other aquatic fauna.

²² IE Consulting (2026). *Mortarstown WWTP Upgrade. Proposed Outfall Pipe & Headwall. Hydrodynamic Technical Report*. March 2026. IE Consulting Ltd for Uisce Éireann.



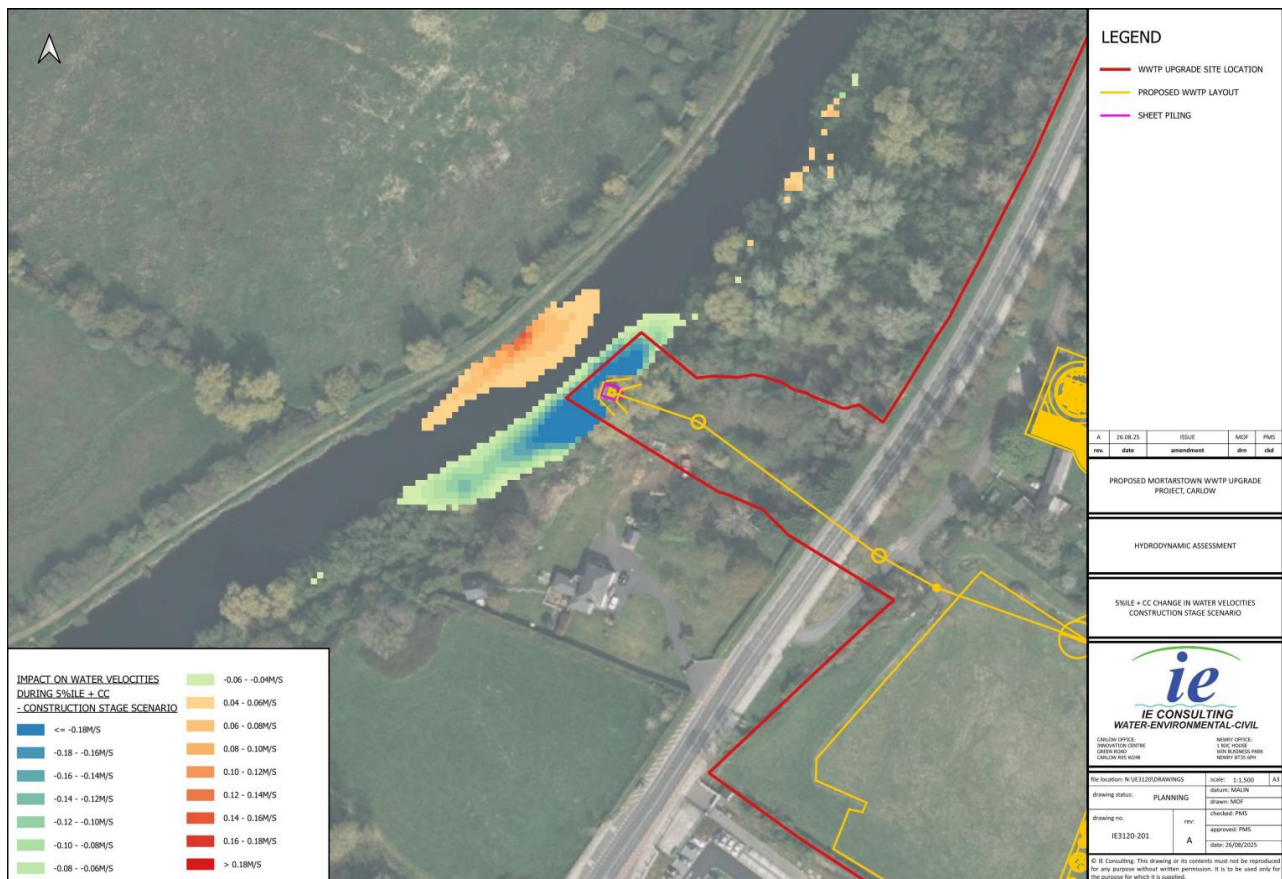


Figure 6-1 - Modelled changes in flow velocities for the construction stage, 5%ile flow + climate change.
Source: IE Consulting (2026).

6.7 Spread of Invasive Non-native Species

Activities associated with the construction of the proposed development, particularly the excavation, storage and movement of soil, stone and other materials, as well as the movement of vehicles and equipment (including the jack-up barge), pose a risk of importing invasive non-native species to the site, spreading such species already present locally, or exporting them from the site.

The species of particular concern in this case are Japanese Knotweed, Himalayan Balsam and Three-cornered Leek and Nuttall's Waterweed. These can have negative impacts on native habitats and species, most notably through competition with and displacement of native species, as well as by altering the physical and chemical properties of the soil. Furthermore, they also represent a project risk as negligence with regard to biosecurity could constitute an offence under Regulation 49 of the Habitats Regulations.

Overall, the ecological effects of any spread of invasive non-native species associated with the construction of the proposed development would likely be moderate to significant, localised in extent and persist long-term.

There is not considered to be any significant risk of the introduction or spread of invasive species arising from the operational activities associated with the proposed development.

6.8 Impacts from Decommissioning and Demolitions

As described in Section 2.2 and illustrated in Figure 2-12, existing plant/items to be demolished as part of the proposed development is as follows:

- Storm tank (area 616m²),
- Inlet works (area 166m²),
- Various small chambers within the site (2 no. chambers, area 3m² and 14m²), and
- Existing sludge cake transfer facility (area 100m²).

Given the scale of these works and their location on the existing WwTP site, remote from the River Barrow and its riparian habitats, there will be no impacts arising from the demolition of these existing plant/items that could adversely affect any of the qualifying interests of the River Barrow and River Nore SAC.

As described in Section 2.3 and illustrated in Figure 2-9, existing plant/items to be decommissioned as part of the proposed development are listed as follows:

- Kilkenny Road WwPS,
- Existing rising main, and
- Existing settlement tanks (2no.).

The decommissioning of any of these plant/items will not give rise to any impacts which could negatively affect any of the sensitive ecological receptors, including the qualifying interests of the River Barrow and River Nore SAC. In particular, it should be noted that the decommissioning of the existing Kilkenny Road WwPS does not include the demolition of the above-ground structure.



6.8.1 Future Decommissioning of Mortarstown WwTP

As stated in Section 2.4, Uisce Éireann will be responsible for any future decisions on continued operation or decommissioning of the WwTP. The design lifespan of the upgraded WwTP is 25 years, but it is anticipated that it will be maintained, and periodic upgrading undertaken over a longer lifetime. In the event of a decision to decommission the WwTP, Uisce Éireann will carry this out as described in Section 2.4 to ensure full compliance with all relevant regulations at that time and that there are no significant effects to the environment, including Natura 2000 sites.



7. Natura 2000 Sites

7.1 Zone of Influence

The “*Zone of Influence*” of a plan or project is the area which may experience ecological effects because of its implementation, including any ancillary activities. The various impacts of a plan or project will each have their own characteristics, e.g., nature, extent, magnitude, duration etc. Accordingly, the area subject to each impact (“zone of impact”) will vary depending on characteristics of the impact and the presence of pathways for its propagation. Ecological features within or connected to one or more zones of impact could, depending on their sensitivities, be affected by the plan or project under consideration. The area containing such features may be regarded as the Zone of Influence. As such, in establishing the Zone of Influence for a plan or project, regard must be had to the characteristics of its potential impacts, potential pathways for impacts and the sensitivities of ecological features in the receiving environment.

In its guidance on selecting which Natura 2000 sites to include in the NIS, *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities* (DEHLG, 2010a) recommends inclusion of sites in the following three categories: -

- Any Natura 2000 sites within or adjacent to the plan or project area,
- Any Natura 2000 sites within the Zone of Influence of the project (to be established on a case-by-case basis, having regard to the nature, scale and location of the project, the sensitivities of the ecological receptors and the potential for in-combination effects), and
- Following the precautionary principle, any other Natura 2000 sites for which the possibility of significant effects cannot be excluded, e.g. for a project with hydrological impacts, it may be necessary to check the full extent of the catchment for Natura 2000 sites with water-dependent qualifying interests.

In addition, *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2021a) recommends consideration of Natura 2000 sites hosting fauna which could move to the plan or project area or its zone(s) of impact, and the potential for the plan or project to sever ecological connectivity within or between Natura 2000 sites. *Appropriate Assessment Screening for Development Management* (OPR, 2021) emphasises the importance of employing the source-pathway-receptor model when selecting Natura 2000 sites for inclusion in the NIS.

Based on the nature, scale and location of the proposed development and the baseline conditions in the receiving natural environment, the zones of impact of the proposed development were defined as: -

- For direct impacts, e.g. habitat loss and fragmentation, all areas within and immediately adjoining the red-line boundary.
- For temporary disturbance to fauna (including from general construction noise and artificial lighting), as well as the spread of invasive species, all areas within a buffer of 150m from the red-line boundary. While a precautionary buffer of c. 500m would often apply, e.g. where sensitive receptors such as waterbird populations occur, a reduced buffer of 150m was selected in this case given the semi-urban setting with its inherent baseline levels of disturbance, the screening effect of existing dense vegetation (woodland and scrub) and the absence of such highly sensitive receptors, e.g. Wigeon, Greenshank or Curlew. This was still considered precautionary given that the most sensitive receptor listed as a qualifying interest of the European



sites concerned is Otter (*Lutra lutra*) and that National Roads Authority (NRA) guidelines²³ suggest a threshold of c. 150m from an active breeding holt for disturbance from activities such as piling or blasting.

- For underwater noise and vibration, the River Barrow up to c. 700m from the proposed outfall works.
- For water quality and other hydrological impacts, e.g. hydrological regime and hydromorphology, the River Barrow adjacent to and downstream of the proposed development.
- For indirect impacts, any other areas with potential ecological connectivity to the above zones of impact, e.g. connected wetlands and waterbodies.

The Zone of Influence was defined as sum of the above zones of impact.

Using QGIS, spatial data for waterbodies and catchments from *EPA Geoportal* were viewed in conjunction with aerial imagery from *Bing Maps* to identify pathways and zones of impact from the proposed development, and other potential ecological connections to the wider landscape. These were then mapped in relation to designated sites using spatial data from *NPWS: Maps and Data* (see Figure 5-1). In addition, the Zone of Influence was examined to identify any other sites, habitats, species or sensitive ecological features with potential ecological connections to these zones of impact.

As shown in Figure 7-1 below, the proposed development intersects the boundaries of 1 no. Natura 2000 sites, namely the River Barrow and River Nore SAC (site code: 002162). Thus, there is clearly a possibility of impacts to this site. This site is described in more detail in Section 7.2 and the potential for adverse effects is assessed in Section 8.1. There are no other European sites within the zones of impact for direct disturbance, invasive alien species or water quality impacts.

Several other sites intersect or adjoin the River Barrow, namely the Lower River Suir SAC (site code: 002137), Blackstairs Mountains SAC (site code: 000770), Slieve Bloom Mountains SAC (site code: 000412), River Nore SPA (site code: 004233) and Slieve Bloom Mountains SPA (site code: 004160), as illustrated Figure 7-2 below. As such, these sites are within the potential zone of impact for indirect impacts. However, as detailed in Table 7-1 below, given the very large distances between these sites and the proposed development, and the sensitivities of their qualifying interests, any ecological connectivity to these sites is extremely weak and does not warrant their further consideration in the NIS.

Ballyprior Grassland SAC, Mountmellick SAC, The Long Derries, Edenderry SAC, Ballynafagh Lake SAC, Ballynafagh Bog SAC, Mouds Bog SAC, and Pollardstown Fen SAC also occur within the wider River Barrow catchment, as illustrated in Figure 7-2 below. However, these are all very small sites located at great distances from the proposed development and without any hydrological or other connectivity to their qualifying interests. As such, there are no pathways for effects to any of these sites.

²³ NRA (2008). *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes*.



Table 7-1 - Other sites in the potential zone of impact for indirect effects.

Natura 2000 site	Qualifying interests	Connectivity to the proposed development
Lower River Suir SAC (002137)	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) (1330) Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation (3260) Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430) Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles (91A0) *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) (91E0) <i>Taxus baccata</i> woods of the British Isles (91J0) Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) (1029) White-clawed Crayfish (<i>Austropotamobius pallipes</i>) (1092) Sea Lamprey (<i>Petromyzon marinus</i>) (1095) Brook Lamprey (<i>Lampetra planeri</i>) (1096) River Lamprey (<i>Lampetra fluviatilis</i>) (1099) Twaite Shad (<i>Alosa fallax fallax</i>) (1103) Salmon (<i>Salmo salar</i>) (1106) Otter (<i>Lutra lutra</i>) (1355)	The River Barrow and River Nore SAC and the Lower River Suir SAC meet near the confluence of the Barrow-Nore and Suir Rivers (in Waterford Harbour) c. 60km south of the proposed development. The main interaction between these sites is exchange of waters and aquatic species in their shared estuary (especially fish, including Twaite Shad and other, non-qualifying interest estuarine and coastal species, as well as mammals such as Otter and seals, and birds). As such, pathways between the proposed development and these receptors are limited to hydrological pathways (water quality and quantity). Given that the estuary is some 50km downstream from the proposed development and the expected scale and duration of construction, any water quality impacts associated with the construction of the proposed development would be imperceptible and, therefore, not affect water quality in the Lower River Suir SAC or species moving between these sites. In terms of the operation of the proposed development, as explained in Section 6.5.2, the overall effects on water quality in the River Barrow will be positive, likely slight in the short term, reducing to imperceptible in the long term, and limited to the locality of the discharge, with no impacts on the downstream estuarine and coastal waters. Therefore, it can be objectively concluded that the proposed development will not adversely affect this Natura 2000 site.
Blackstairs Mountains SAC (000770)	Northern Atlantic wet heaths with <i>Erica tetralix</i> (4010) European dry heaths (4030)	The Blackstairs Mountains SAC is located c. 21km south-east of the proposed development (over land) and is also connected to the River Barrow via several of its tributaries. The qualifying interests of this site are terrestrial sites remote from the proposed development and not dependent on any of the habitats or species



Natura 2000 site	Qualifying interests	Connectivity to the proposed development
		found in closer proximity to the proposed development. As such, there is no connectivity for any impacts, whether direct or indirect, and it can therefore be concluded that the proposed development will not affect this Natura 2000 site.
Slieve Bloom Mountains SAC (000412)	Northern Atlantic wet heaths with <i>Erica tetralix</i> (4010) Blanket bogs (* if active bog) (7130) *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnus incana</i> , <i>Salix alba</i>) (91E0)	The Slieve Bloom Mountains SAC is located c. 43km north-west of the proposed development (at its closest point) and >70km upstream. The qualifying interests of this site are terrestrial sites remote from the proposed development and not dependent on any of the habitats or species found in closer proximity to the proposed development. As such, there is no connectivity for any impacts, whether direct or indirect, and it can therefore be concluded that the proposed development will not affect this Natura 2000 site.
River Nore SPA (004233)	Kingfisher (<i>Alcedo atthis</i>) (A229)	The River Nore SPA includes much of the main channel of the River Nore and several of its tributaries. It is situated c. 25km to the north-west, west and south-west of the proposed development. The confluence of the Rivers Barrow and Nore is c. 55km downstream of the proposed development, and the SPA is located on the River Nore c. 10km upstream of its confluence with the Barrow, i.e. 65km from the proposed development via surface water pathways. There are no pathways through which the proposed development could directly or indirectly affect Kingfisher in the SPA.
Slieve Bloom Mountains SPA (004160)	Hen Harrier (<i>Circus cyaneus</i>) (A082)	The Slieve Bloom Mountains SPA is located c. 41km north-west of the proposed development (at its closest point) and >70km upstream. There are no pathways by which the proposed development could affect the quantity or quality of habitat within the SPA, or give rise to disturbance there. As suitable habitat for either breeding or wintering Hen Harrier does not occur within or near the proposed development footprint, there is no potential for ex-situ impacts. There are no other pathways for indirect or secondary effects on Hen Harrier in this SPA.



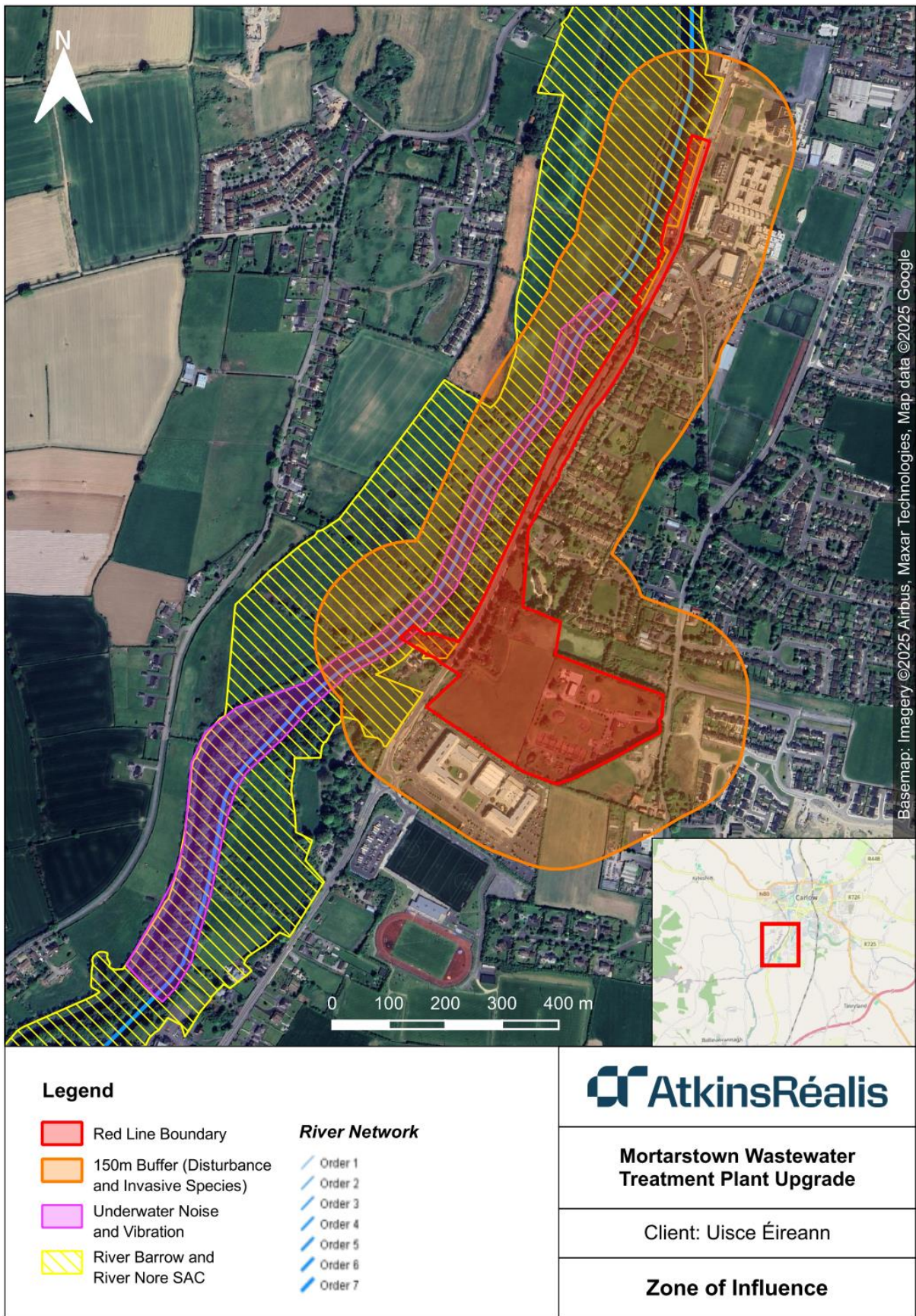


Figure 7-1 - Zones of impact from the proposed development in relation to the boundaries of Natura 2000 sites.

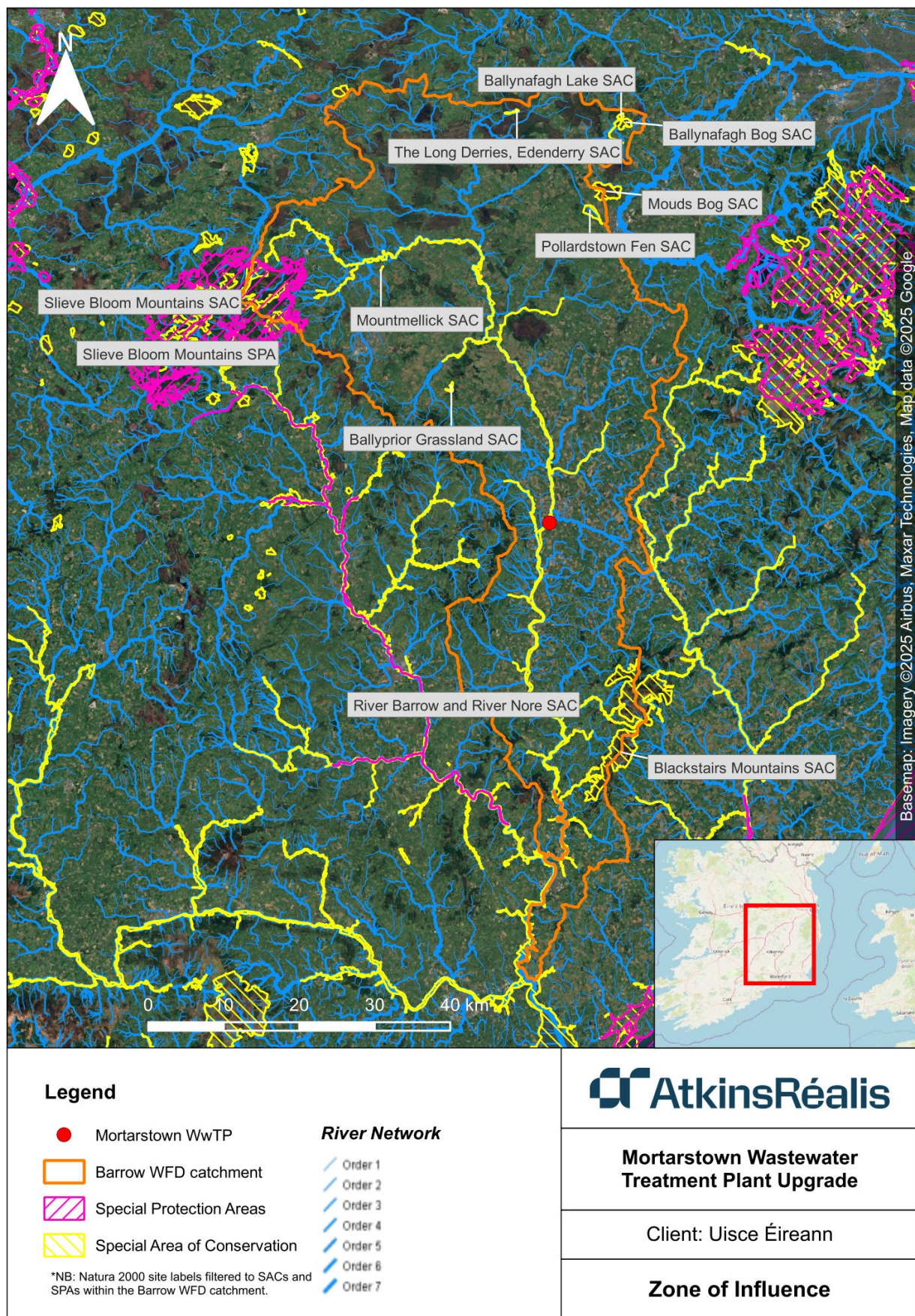


Figure 7-2 - Natura 2000 sites in the wider River Barrow catchment.

7.2 Site Descriptions

The descriptions of Natura 2000 sites presented in this section are based on the Site Synopsis, Conservation Objectives and Natura 2000 Standard Data Form documents for the sites concerned, augmented by information from the supporting documents available on the site-specific pages of the NPWS website.

Annex I habitat types marked with an asterisk (*) are “priority habitat types”, i.e., natural habitat types in danger of disappearing and for the conservation of which the EU has a particular responsibility given the proportion of their natural ranges falling within the European territory of Member States.

7.2.1 River Barrow and River Nore SAC

7.2.1.1 Overview

The following description is largely taken from the Site Synopsis for the site (NPWS, 2024). This is a wide overview of the site. The locations of each of the different qualifying interests in relation to the proposed development are given in Table 8-1.

This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far as Creadun Head in Waterford. Towns along the River Barrow (from upstream to downstream) include Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Bagenalstown, Graiguenamanagh and New Ross. The larger of the many tributaries of the Barrow include the Owenass, Stradbally, Boherbaun and Lerr Rivers (upstream of Carlow) and the Fushoge, Mountain, Aughavaud, Boherbaun (downstream of Carlow).

The site is very important for the presence of a number of animal species listed on Annex II to the Habitats Directive, including Freshwater Pearl Mussel, White-clawed Crayfish, Salmon, Twaite Shad, Sea Lamprey, Brook Lamprey and River Lamprey, the tiny whorl snail *Vertigo moulinsiana* and Otter. This is one of only a handful of spawning grounds in the country for Twaite Shad (just above the tidal reaches).

Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II to the Habitats Directive. Furthermore, it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows add further interest to this site.

7.2.1.2 Qualifying Interests and Conservation Objectives

The River Barrow and River Nore SAC was selected for the following qualifying interests: -

- Estuaries (1130)
- Mudflats and sandflats not covered by seawater at low tide (1140)
- Reefs (1170)
- *Salicornia* and other annuals colonising mud and sand (1310)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330)
- Mediterranean salt meadows (*Juncetalia maritimi*) (1410)



- Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation (3260)
- European dry heaths (4030)
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430)
- *Petrifying springs with tufa formation (*Cratoneurion*) (7220)
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (91A0)
- *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0)
- Desmoulin's Whorl Snail (*Vertigo moulinsiana*) (1016)
- Freshwater Pearl Mussel (*Margaritifera margaritifera*) (1029)
- White-clawed Crayfish (*Austropotamobius pallipes*) (1092)
- Sea Lamprey (*Petromyzon marinus*) (1095)
- Brook Lamprey (*Lampetra planeri*) (1096)
- River Lamprey (*Lampetra fluviatilis*) (1099)
- Twaite Shad (*Alosa fallax fallax*) (1103)
- Salmon (*Salmo salar*) (1106)
- Otter (*Lutra lutra*) (1355)
- Killarney Fern (*Vandenboschia speciosa*) (6985)

For each qualifying interest, the Site-specific Conservation Objectives (SSCO) document for the site (NPWS, 2025b) provides an overall objective to either maintain or restore its favourable conservation condition within the site. Table 7-2 below shows which qualifying interests have an SSCO to maintain their favourable conservation condition and which have an SSCO to restore it. These SSCOs are defined by detailed attributes and corresponding targets (see the SSCO document for full details).

Table 7-2 - Site-specific conservation objectives for the qualifying interests of the River Barrow and River Nore SAC. Source: NPWS (2025b).

Maintain favourable conservation condition	Restore favourable conservation condition
▪ Estuaries ▪ Mudflats and sandflats not covered by seawater at low tide ▪ Reefs ▪ <i>Salicornia</i> and other annuals colonising mud and sand ▪ Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	▪ Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) ▪ Mediterranean salt meadows (<i>Juncetalia maritimi</i>) ▪ Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles ▪ *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) ▪ Freshwater Pearl Mussel



Maintain favourable conservation condition	Restore favourable conservation condition
▪ European dry heaths ▪ Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels ▪ *Petrifying springs with tufa formation (<i>Cratoneurion</i>) ▪ Desmoulin's Whorl Snail ▪ White-clawed Crayfish ▪ Killarney Fern	▪ Sea Lamprey ▪ Brook Lamprey ▪ River Lamprey ▪ Twaite Shad ▪ Salmon ▪ Otter

The Site-specific Conservation Objectives (NPWS, 2025b) states: “Please note that this SAC is adjoins Lower River Suir SAC (002137), Blackstairs Mountains SAC (000770), Slieve Bloom Mountains SAC (000412) and overlaps with River Nore SPA (004233) and Slieve Bloom Mountains SPA (004160). See map 1a. The conservation objectives for this site should be used in conjunction with those for overlapping and adjoining site(s) as appropriate. IMPORTANT: This ‘Version 2’ document includes 1 additional QI (1170), 3 updates to existing QIs (1029/1130/1140) and 1 QI removal (1990). The conservation objectives for other pre-existing QIs have generally not been updated.”

7.2.1.3 Threats, Pressures and Activities

The following description is largely taken from the Site Synopsis for the site (NPWS, 2024), with project-specific details added.

Land use at the site consists mainly of agricultural activities – mostly intensive in nature and principally grazing and silage production. Slurry is spread over much of the area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to water quality and populations of Annex II species within the site. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the main rivers and their tributaries. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. There is net fishing in the estuary and a mussel bed also. Other recreational activities such as boating, golfing and walking, particularly along the Barrow towpath, are also popular. There is a golf course on the banks of the Nore at Mount Juliet and GAA pitches on the banks at Inistioge and Thomastown. There are active and disused sand and gravel pits throughout the site. Several industrial developments, which discharge into the river, border the site. New Ross is an important shipping port. Shipping to and from Waterford and Belview ports also passes through the estuary.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, over-grazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel and Rhododendron. Water quality in the site remains vulnerable. Good water quality is necessary to maintain the populations of the Annex II animal species listed as qualifying interests of the site and is dependent on controlling fertilisation of the grasslands and proper treatment of wastewater before discharge to watercourses. This underscores the need for the proposed upgrade to the Mortarstown WwTP. Drainage activities in the catchment can lead to flash floods which can damage the many Annex II species present. Capital and maintenance dredging within the lower reaches of the system pose a threat to migrating fish species such as lamprey and shad. Land reclamation also poses a threat to the salt meadows and the populations of legally protected species therein.

Table 7-3 below lists the threats, pressures and activities with negative impacts on the site, as per its Natura 2000 Standard Data Form (NPWS, 2025a).



Table 7-3 - Threats, pressures and activities with negative impacts on the site. Source: BISE (2025).²⁴

Threats and pressures	Rank
Agricultural intensification	High
Dykes and flooding defence in inland water systems	High
Erosion	High
Modifying structures of inland water courses	High
Pollution to surface waters (limnic, terrestrial, marine & brackish)	High
Changes in abiotic conditions	Medium
Dredging/ removal of limnic sediments	Medium
Fishing and harvesting aquatic resources	Medium
Forest and Plantation management & use	Medium
Forestry activities not referred to above	Medium
Human induced changes in hydraulic conditions	Medium
Intensive cattle grazing	Medium
Invasive non-native species	Medium
Peat extraction	Medium
Reduction in migration/ migration barriers	Medium
Use of fertilizers (forestry)	Medium
Water abstractions from surface waters	Medium
Industrial or commercial areas	Low
Intensive fish farming, intensification	Low
Leisure fishing	Low
Netting	Low
Port areas	Low
Removal of hedges and copses or scrub	Low
Sand and gravel quarries	Low

²⁴ <https://biodiversity.europa.eu/sites/natura2000/IE0002162>



8. Assessment of Effects

8.1 Identification of Potential Adverse Effects

The identification of potential adverse effects in this section follows the “source-pathway-receptor” model. According to this model, for an effect to exist, all three of the following criteria must be met: -

- Some aspect of the plan or project must act as a source of an impact.
- There must be a pathway capable of conveying the impact to a receptor.
- The receptor must be sensitive to the impact.

Types of impacts likely to arise from the proposed works are identified and discussed in Section 6, pathways for those impacts are outlined in Section 7.1 (as illustrated Figure 7-1), and receptors are described in Section 7.2. The following subsections identify and analyse the specific effects on each receptor and evaluate their significance in view of the relevant conservation objectives.

8.1.1 River Barrow and River Nore SAC

Potential adverse effects on the River Barrow and River Nore SAC are identified, in view of the conservation objectives of the site, in Table 8-1 below. Where such effects are identified, they are subsequently analysed and evaluated in more detail in Section 8.2.

Table 8-1 - Identification of potential adverse effects on the River Barrow and River Nore SAC.

Qualifying interest	Identification of potential adverse effect	Potential adverse effect
Estuaries Mudflats and sandflats not covered by seawater at low tide Reefs <i>Salicornia</i> and other annuals colonising mud and sand Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	All of these qualifying interest habitats are located >50km downstream of the proposed development, in the estuarine portion of the SAC. As such, pathways between the proposed development and these habitats are limited to hydrological pathways (water quality and quantity). Given this vast distance and the expected scale and duration of construction, any water quality impacts associated with the construction of the proposed development would be imperceptible and would not affect the conservation condition of any of these coastal habitats. In terms of the operation of the proposed development, as explained in Section 6.5.2, the overall effects on water quality in the River Barrow will be positive, likely slight in the short term, reducing to imperceptible in the long term, and limited to the locality of the discharge, with no impacts on the downstream estuarine and coastal waters. Therefore, it can be objectively concluded that the proposed development will not adversely affect the conservation objectives for any of these estuarine/coastal qualifying interests.	No
Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	The site-specific conservation objectives document states that this habitat type was selected as a qualifying interest based on the presence of an excellent example of a nutrient-rich sub-type associated with extensive tufa deposits in the King's River, a tributary of the Nore. However, it also notes that other examples of this and other sub-types may be present elsewhere in the site. Furthermore, the Article 17 Reports (NPWS,	Yes



Qualifying interest	Identification of potential adverse effect	Potential adverse effect
	2025d,e) note the very broad definition of this habitat type, encompassing a wide range of sub-types, which have in themselves yet to be defined in an Irish context, and, accordingly, uses the full extent of EPA rivers as the national distribution for this habitat type. This indicates that the Annex I habitat occurs throughout Ireland's river systems. As such, the River Barrow is taken to be an example of this qualifying interest habitat. Specifically, the river in the vicinity of the proposed development represents a lowland depositing sub-type, and is also structurally and functionally linked to other examples and sub-types in the catchment. Given that the proposed development requires in-stream construction activities, there is potential for direct habitat loss or damage and hydrological impacts, which could affect the conservation condition of the habitat. Therefore, the possibility of adverse effects on the conservation objective for this qualifying interest cannot be ruled out at this stage. More detailed analysis and evaluation of the potential effects on this qualifying interest is provided in Section 8.2 below.	
European dry heaths	No evidence of this qualifying interest habitat was found in the vicinity of the proposed development during either the desk study or field surveys, and there are no pathways for impacts to any examples of this habitat type. Therefore, it can be objectively concluded that the proposed development will not adversely affect the conservation objective for this qualifying interest.	No
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	No evidence of this qualifying interest habitat was found in the immediate vicinity of the proposed development during either the desk studies or field surveys. Therefore, there is no potential for direct loss or fragmentation of any examples of this habitat. However, given the nature of this habitat type, it is likely to be present along the banks of the River Barrow further downstream of the development site. As such, there is potential for indirect hydrological impacts, most notably water quality impacts, which could affect the conservation condition of the habitat. Therefore, the possibility of adverse effects on the conservation objective for this qualifying interest cannot be excluded at this stage. More detailed analysis and evaluation of the potential effects on this qualifying interest is provided in Section 8.2 below.	Yes
*Petrifying springs with tufa formation (<i>Cratoneurion</i>)	No evidence of this qualifying interest priority habitat was found in the immediate vicinity of the proposed development during either the desk studies or field surveys. Therefore, there is no potential for direct loss or fragmentation on any examples of this habitat. The only known example of this qualifying interest priority habitat in the SAC occurs at Dysart Wood along the River Nore (NPWS, 2025b), almost 40km from the proposed development. Given the absence of this habitat from the vicinity of the proposed development and the very localised extent of any impacts from the proposed development on groundwater, there will be no adverse effect on the conservation objective for this qualifying interest as a result of the construction or operation of the proposed development.	No

Qualifying interest	Identification of potential adverse effect	Potential adverse effect
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	No evidence of this qualifying interest habitat was found in the immediate vicinity of the proposed development during either the desk studies or field surveys. Therefore, there is no potential for direct impacts on any examples of this habitat. The nearest known occurrence of this habitat within the SAC is at Tinnahinch, near Graiguenamanagh (NPWS, 2025b), c. 30km south of the proposed development. While closer examples may exist, they are not adjacent to the proposed development or linked to it. As such, there are no pathways for indirect impacts. Therefore, it can be objectively concluded that the proposed development will not adversely affect the conservation objective for this qualifying interest.	No
*Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)	Field surveys carried out to inform this assessment found that an example of this qualifying interest occurs adjacent to the proposed development (O'Connor, 2023; see Appendix A). Specifically, this habitat occurs as part of a mosaic of different woodland types, as described and illustrated in Section 5.2 above – see full details, including habitat mapping and classification, in the Alluvial Woodland Survey Report in Appendix B to this NIS. Given the close proximity to this priority habitat, the possibility of adverse effects on the conservation objective for this qualifying interest cannot be excluded at this stage. More detailed analysis and evaluation of the potential effects on this qualifying interest is provided in Section 8.2 below.	Yes
Desmoulin's Whorl Snail	No suitable habitat for this species was found in the vicinity of the proposed development during the desk study or field surveys. Therefore, it was not necessary to carry out targeted surveys for this species. The nearest published records of Desmoulin's Whorl Snail are from near Athy (c. 17km to the north) and Borris Bridge (c. 24km to the south), as per <i>Biodiversity Maps</i> [accessed 19/08/2025]. As suitable habitat may occur along the margins of the River Barrow upstream of downstream of the proposed development, there is a pathway for hydrological impacts, with changes to hydrological regime being the most critical in relation to this species, rather than water quality (Moorkens & Killeen, 2011). However, as explained in Section 6.6 above, any impact on hydrological regime from the proposed development would be limited to the construction phase, very small in magnitude and extremely localised. As such, there would be no perceptible impact on any whorl snail habitat. Therefore, it can be objectively ascertained that there will be no adverse effect on the conservation objective for this qualifying interest as a result of the construction or operation of the proposed development.	No
Freshwater Pearl Mussel	Within the SAC, this qualifying interest species is confined to the River Nore, the Ballymurphy River and the Mountain River, the latter two being tributaries of the River Barrow (NPWS, 2025b). There is no evidence of an extant population of this species in the main channel of the River Barrow. As such, there is no possibility of direct impacts, nor is there potential for indirect (downstream) impacts via hydrological pathways. The only possible pathway would be for secondary effects via fish species which are hosts for the glochidial life stage of the pearl mussel. As per NPWS (2025b), the host fish are 0+ and 1+ age-class Brown Trout (<i>Salmo trutta</i>)	No



Qualifying interest	Identification of potential adverse effect	Potential adverse effect
	or Atlantic Salmon (<i>S. salar</i>), and the mere presence (rather than numbers or densities) of these fish in the mussel habitat from 0+ to the 1+ summer is considered sufficient for mussels to complete the glochidial life stage. Given the proposed development's effects on water quality, as described in Section 6.5 above, there is no possibility of a complete loss (or any significant reduction) of host fish, whether locally to the proposed development or in the pearl mussel catchments. Therefore, it can be objectively ascertained that the proposed development will not adversely affect the conservation objective for this qualifying interest.	
White-clawed Crayfish Sea Lamprey Brook Lamprey River Lamprey Twaite Shad Salmon Otter	During the desk study and field surveys, it was established that all of these species either do occur within or along the River Barrow in the vicinity of the proposed development or are likely to be present in the river at or downstream of the proposed development for at least part of the year. As such, there is potential for direct, indirect or secondary impacts. Therefore, the possibility of adverse effects on the conservation objectives for these qualifying interests cannot be excluded at this stage. More detailed analysis and evaluation of the potential effects on these qualifying interests is provided in Section 8.2 below.	Yes
Killarney Fern	The nearest published record of Killarney Fern within the SAC is at Tinnahinch, near Graiguenamanagh (NPWS, 2025b), c. 30km south of the proposed development. Both the sporophyte and gametophyte life stages of this species require deeply shaded and very humid, sheltered habitats, e.g. dripping caves, cliffs, crevices and gullies by waterfalls, crevices in woodland (Ní Dhúill et al., 2015). These conditions do not occur within, adjacent to or with any connectivity to the proposed development. No evidence of Killarney Fern or suitable habitat for it was found in the vicinity of the proposed development during the desk study or field surveys. As such, there is no potential for direct impacts on any specimens or their habitat and there are no pathways for indirect impacts. Therefore, it can be objectively concluded that the proposed development will not adversely affect the conservation objective for this qualifying interest.	No

8.1.2 Summary

On the basis of objective information presented in the preceding sections, Table 8-1 has found the following:

- There is no possibility of adverse effects on the following qualifying interests of the River Barrow and River Nore SAC:
 - Estuaries
 - Mudflats and sandflats not covered by seawater at low tide
 - Reefs
 - *Salicornia* and other annuals colonising mud and sand
 - Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)



- Mediterranean salt meadows (*Juncetalia maritimi*)
- European dry heaths
- *Petrifying springs with tufa formation (*Cratoneurion*)
- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- Desmoulin's Whorl Snail
- Freshwater Pearl Mussel
- Killarney Fern
- Adverse effects on the following qualifying interests of the River Barrow and River Nore SAC cannot be ruled out at this point, so further assessment is required:
 - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
 - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
 - *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
 - White-clawed Crayfish
 - Sea Lamprey
 - Brook Lamprey
 - River Lamprey
 - Twaite Shad
 - Salmon
 - Otter



8.2 Analysis and Evaluation of Effects

8.2.1 'Vegetation of flowing waters'

The site-specific conservation objective for 'Water courses of plain to montane levels with the *Ranunculum fluitantis* and *Callitricho-Batrachion* vegetation' is to "maintain" its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-2 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

On the basis of the assessment in Table 8-2, there are potential adverse effects on this conservation objective in terms of suspended sediment arising from construction activities and changes to vegetation composition arising due to the presence of invasive species. Therefore, mitigation is required for construction-phase water quality impacts and construction-related invasive species risks.



Table 8-2 - Analysis and evaluation of effects on ‘Vegetation of flowing waters’ (3260). Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Habitat distribution	No decline, subject to natural processes	The proposed development does not involve any realignment or other major modifications to any watercourse. Therefore, it will not give rise to any change in the distribution of riverine habitats.	No adverse effect
Habitat area	Area stable or increasing, subject to natural processes	The installation of the new outfall headwall will lead to a direct loss of a very small area of habitat from within the river channel (c. 130m ² within the cofferdam during construction, thereafter reducing to 5m ² occupied by the permanent headwall). This is a miniscule loss in terms of the total area of riverine habitats (Annex I or otherwise) within the SAC. As such, it does not represent a material change to the habitat area.	No adverse effect
Hydrological regime: river flow	Maintain appropriate hydrological regimes	As detailed in Section 6.6 above, the proposed development will not have any perceptible effects on hydrological regime or hydromorphology in the operational phase, while such effects during construction are as follows: in the very worst-case scenario (cofferdam in place, 5%ile flow + climate change), maximum increase in flow velocity of 0.14-0.16m/s on the right bank of the river (in parts of the channel velocities are unaffected or reduced); mean change over this cross-section is +0.03m/s; limited to within 40m upstream and 70m downstream of outfall works; in the same scenario, water level upstream is predicted to increase by c. 1cm, downstream to decrease by c. 1cm (restricted to within c. 100m of outfall works). Such minor changes over a localised extent and limited to the duration of the construction stage will not alter the conditions in any examples of this habitat, including patterns of erosion, transport and deposition of sediment.	No adverse effect
Hydrological regime: groundwater discharge	The groundwater flow to the habitat should be permanent and sufficient to maintain tufa formation	This Attribute relates to tufaceous sub-types only (not found in the vicinity of the proposed development). In any case, the proposed development will not alter the rate of groundwater discharge to the riverbed.	No adverse effect



Attribute	Target	Analysis	Evaluation
Substratum composition: particle size range	The substratum should be dominated by large particles and free from fine sediments	This Attribute relates to tufaceous sub-types only (not found in the vicinity of the proposed development). In any case, the proposed development does not provide for any direct changes to substrate particle size or indirect changes via hydrological regime or hydromorphological impacts.	No adverse effect
Water chemistry: minerals	The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa formations	This Attribute relates to tufaceous sub-types only (not found in the vicinity of the proposed development). In any case, the proposed development does not provide for any changes to the mineral status of the river.	No adverse effect
Water quality: suspended sediment	The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments	This Attribute relates primarily to tufaceous sub-types, but could also apply generally. As identified in Section 6.5.1 above, the construction of the proposed development, especially excavations, earthworks and in-stream works, have the potential to cause input of fine sediments to the water column if exposed soil/material stockpiles and surface water run-off are not appropriately managed during the works. This represents a potential adverse effect and requires mitigation. The design of the proposed development provides for significant additional stormwater storage capacity, which will lead to a reduction in the current frequency and volume of stormwater overflows. This represents a reduction in the input of suspended sediment from surface water drainage systems in Carlow town. As such, the effect of the operation of the proposed development is positive in this regard.	Potential adverse effect from construction-phase water quality impacts
Water quality: nutrients	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition	There are no pathways by which the construction of the proposed development could alter the concentrations of nutrients in the River Barrow. Levels of nutrients in treated effluent will be controlled by the treatment process and regulated by the ELVs which have been set. The operation of the WwTP in accordance with its Discharge Licence will ensure that it does not lead to any significant changes in the nutrient status of the River Barrow.	No adverse effect



Attribute	Target	Analysis	Evaluation
Vegetation composition: typical species	Typical species of the relevant habitat sub-type should be present and in good condition	NPWS (2025b) states that the sub-types of this habitat are poorly understood and their typical species have not yet been defined. In the vicinity of the proposed development, the slow, smooth flow type and silted margins of the River Barrow are typical of the lowland depositing sub-type. Shade from overhanging trees limits macrophyte growth in the margins to occasional Arrowhead and the invasive Nuttall's Waterweed. In the absence of appropriate control measures, the in-stream works for the installation of the new outfall headwall, including the use of a barge, have potential to cause localised spread of Nuttall's Waterweed and other aquatic invasive plant species. As noted above, the operation of the proposed development will not lead to any significant change to nutrient status which could alter species composition. Similarly, there will be no permanent artificial lighting of the river channel.	Potential adverse effect from construction-related invasive species risks
Floodplain connectivity	The area of active floodplain at and upstream of the habitat should be maintained	The proposed development does not provide for any loss of connectivity between the River Barrow and its floodplain at any location, during either the construction or operational phases. Therefore, there will be no adverse effect in this regard.	No adverse effect



8.2.2 ‘Hydrophilous tall herb swamp’

The site-specific conservation objective for ‘Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels’ is to “maintain” its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-3 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

On the basis of the assessment in Table 8-3, there are potential adverse effects on this conservation objective in terms of negative indicator species, namely Himalayan Blasam and Japanese Knotweed, arising due to the works for the new outfall. Therefore, mitigation is required for the construction-related invasive species risks.



Table 8-3 - Analysis and evaluation of effects on 'Hydrophilous tall herb swamp' (6430). Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Habitat distribution	No decline, subject to natural processes	There will be no removal of any example of this habitat type associated with the proposed development. Therefore, its distribution will not be affected.	No adverse effect
Habitat area	Area stable or increasing, subject to natural processes	There will be no removal of any area of this habitat type associated with the proposed development. Therefore, the total area will not be affected.	No adverse effect
Hydrological regime: flooding depth/height of water table	Maintain appropriate hydrological regimes	As detailed in Section 6.6 above, the proposed development will not have any perceptible effects on hydrological regime or hydromorphology in the operational phase, while such effects during construction are as follows: in the very worst-case scenario (cofferdam in place, 5%ile flow + climate change), maximum increase in flow velocity of 0.14-0.16m/s on the right bank of the river (in parts of the channel velocities are unaffected or reduced); mean change over this cross-section is +0.03m/s; limited to within 40m upstream and 70m downstream of outfall works; in the same scenario, water level upstream is predicted to increase by c. 1cm, downstream to decrease by c. 1cm (restricted to within c. 100m of outfall works). Such minor changes over a localised extent and limited to the duration of the construction stage will not alter the prevailing hydrological regime in any example of this habitat.	No adverse effect
Vegetation structure: sward height	30-70% of sward is between 40 and 150cm, in height	As there will be no works within any example of this habitat type or any change to the long-term hydrological regime, there will be no effect on sward height in any example of this habitat type.	No adverse effect
Vegetation composition:	Broadleaf herb component of vegetation between 40 and 90%	As there will be no works within any example of this habitat type or any change to the nutrient status or management of	No adverse effect



Attribute	Target	Analysis	Evaluation
broadleaf herb:grass ratio		such habitats, there will be no effect on the herb:grass ratio in any example of this habitat type.	
Vegetation composition: typical species	At least 5 positive indicator species present	As there will be no works within any example of this habitat type or any change to the hydrological regime, nutrient status or management of such habitats, there will be no effect on the species composition or presence of positive indicator species in any example of this habitat type.	No adverse effect
Vegetation composition: negative indicator species	Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (<i>Impatiens glandulifera</i>), monkeyflower (<i>Mimulus guttatus</i>), Japanese knotweed (<i>Fallopia japonica</i>) and giant hogweed (<i>Heracleum mantegazzianum</i>)	During the construction phase, works for the installation of the new outfall headwall will interact with two non-native invasive species of concern, namely Himalayan Balsam and Japanese Knotweed. In the absence of appropriate control measures, the works have the potential to release propagules of this species into the river, where they could potentially flow downstream and invade examples of this habitat type.	Potential adverse effect from construction-related invasive species risks



8.2.3 ‘*Alluvial woodland’

The site-specific conservation objective for ‘*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)’ is to “restore” its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-4 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

In addition, it is noted that construction works for the proposed development are likely to include artificial lighting of the works areas. As explained in Section 6.3 above, artificial lighting at night can negatively affect habitats. There will be no new artificial lighting of any woodland during the operational phase.

On the basis of the assessment in Table 8-4 and above, there are potential adverse effects on this conservation objective in terms of vegetation composition arising due to the presence of invasive species. Therefore, mitigation is required for construction-related invasive species risks. Mitigation is also required to control the impacts associated with artificial lighting during the construction phase.



Table 8-4 - Analysis and evaluation of effects on ‘*Alluvial woodland’ (91E0). Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Habitat area	Area stable or increasing, subject to natural processes, at least 181.54ha for sites surveyed: see map 6	As stated to the left, NPWS (2025b) gives the total area of this habitat in the SAC as 181.54ha.²⁵ The total extents of the woodland and scrub zones identified by the targeted woodland surveys carried out to inform this NIS are as follows: - Zone A (priority Annex I alluvial woodland): 40,501m² (4.05ha) - Zone B (important supporting woodland): 1,258m² (0.13ha) - Zone C (woodland with limited supporting function): 374m² (0.04ha) - Zone D (scrub with no supporting function): 150m² (0.02ha) - Zone E (scrub with limited supporting function): 2,347m² (0.23ha) The 4.05ha of priority Annex I alluvial woodland (zone A) is equivalent to 2.23% of the 181.54ha baseline figure for the SAC, as mapped in NPWS (2025b). As this patch is not included in the baseline figure and further un-surveyed areas are likely to be present (as acknowledged by the NPWS), it likely represents an even smaller percentage of the true area of this habitat within the SAC. Immediately south of the existing WwPS, a corner of the woodland and adjoining scrub (area c. 520m², of which c. 370m² is woodland) will need to be cleared to accommodate the reception shafts for the new gravity sewer as well as the temporary works (see maximum extent of temporary works area in Figure 8-1 below). The c. 370m² represents <1% of the total c. 42,133m² covered by this woodland patch and includes	No adverse effect

²⁵ The figure given in the Natura 2000 Standard Data Form (last updated in 2020) is 110.07ha. In consultation with the NPWS, it was established that this smaller figure is due to the accidental exclusion of one patch of 71.47ha near Durrow from the spatial data file. This patch was identified by the NPWS in-house woodland expert separately from the *National Survey of Native Woodlands* (Perrin et al., 2008). On that basis, the NPWS advised that the figure of 181.54ha should be taken as the baseline figure, but it must be acknowledged that the full extent of the SAC has not yet been surveyed, so the true area is likely greater than this. As such, it represents a conservation figure suitable for use in an assessment in line with the precautionary principle.



Attribute	Target	Analysis	Evaluation
		vegetation from zones B and C, but none from zone A. Furthermore, the permanent infrastructure is entirely within zone D (much of which has already been cleared or disturbed multiple times in recent years and all of which is outside the SAC boundary). With regard to the clearance in zones B and C, the temporary works area includes c. 185m from each zone, approx. half of which is within the SAC boundary (both zones), and this area will be left to regenerate post-construction. Therefore, in this area, there will be: ▪ No loss of any priority Annex I alluvial woodland, whether inside or outside the SAC, ▪ No permanent loss of any supporting woodland, and ▪ No permanent loss of any habitat within the SAC. At the downstream end of the woodland, as illustrated in Figure 8-2 and Figure 8-3 below, Independent Tree Surveys (2025) (see Appendix H to this NIS) states: <i>“The two mature Willow trees (T59 and T60) on the bank of the River Barrow will suffer damage from the trenching associated with the installation of the new outfall pipe. The full extent of the damage (to the roots and above ground parts of the trees) will only be apparent as the works progress, the intention being to try and retain the trees whilst laying the new pipe through the only viable route to the river channel. The trees may require pruning to reduce their size or coppicing if they sustain significant damage during the works.”</i> These trees and the area beneath them is considered to be part of the alluvial woodland. However, as they are to be retained, the only impacts to the woodland here are temporary disturbance to the ground layer and potentially some damage to the trees, such as may occur during a severe flood, which is one of the critical natural processes that defines this habitat. Therefore, this does not represent a loss of woodland habitat.	



Attribute	Target	Analysis	Evaluation
		As the possibility of future decline of these trees as a result of root or other damage sustained during the works cannot be excluded at this stage, in accordance with the precautionary principal, the implications of the very worst-case scenario, i.e. loss of these trees, is considered. These trees contribute a maximum of c. 350m² to the total c. 42,133m² covered by this woodland patch, i.e. <1%. The area under these trees is in zone A (priority Annex I alluvial woodland) and represents <0.02% of the 181.54ha baseline figure for the SAC. As such, their loss (if it were to occur) would not adversely affect the Attribute of habitat area. Furthermore, this area will be left to regenerate (with ongoing removal of invasive non-native species) post-construction. There will be no additional habitat loss from utility diversions or other ancillary works.	
Habitat distribution	No decline. Surveyed locations shown on map 6 [in the Conservation Objectives document]	The small area of non-Annex I woodland south of the existing WwPS which will be cleared during construction (and left to regenerate thereafter) represents <1% of the total area of the woodland patch in question and does not provide any connectivity with other woodland patches or otherwise support the overall coherence of any network of alluvial woodlands. Therefore, its temporary loss will not adversely affect the distribution of alluvial woodland habitat in the SAC. The 2no. mature willows T59 and T60 are considered to be part of the priority Annex I habitat (zone A). While they only contribute <1% to the total area of the woodland patch, they also contribute to the continuity of woodland/treeline canopy along the riverbank. Immediately south of these trees, there is a c. 35m gap in canopy cover before the next woodland patch downstream. In the unlikely event of the loss of both of these trees, that gap would increase to c. 50m. This distance is negligible in terms of	No adverse effect



Attribute	Target	Analysis	Evaluation
		pollen and seed dispersal from species such as willows and alder, which can disperse seeds and pollen over large distances by wind and on water. As such, the loss of these trees would not affect the connectivity and overall coherence of the alluvial woodland network along the River Barrow and, therefore, would not adversely affect the distribution of alluvial woodland habitat in the SAC. Furthermore, this area will be left to regenerate (with ongoing removal of invasive non-native species) post-construction, so the gap in canopy cover will narrow again into the future.	
Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The area of the patch of priority alluvial woodland adjoining the proposed development is 4.05ha. Taking into account the adjoining supporting woodland habitats, this grows to 4.21ha, with a further 0.23ha in zone E were allowed to develop into woodland. As such, the maximum size of this patch would be 4.44ha. This is larger than the 3.0ha targeted minimum size for "small" woods, but will be below the threshold of 25ha for "large" woods. The maximum loss of woodland due to the proposed development would be 0.07ha (none of which is permanent). Therefore, there is no possibility that the proposed development could lead to the size of the woodland patch reducing below 3.98ha, well above the 3ha threshold relevant for this small wood.	No adverse effect
Woodland structure: cover and height	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	The proposed development will not alter the overall structure of the alluvial woodland. The clearance of a small area of adjoining non-Annex I habitat during construction (south of the existing WwPS) does not split the woodland or involve the opening up of the canopy in the Annex I area. There will be a slight increase in exposure in the adjoining Annex I area during construction. This will reduce as the cleared area regenerates and will not lead to any significant change in the vegetation structure in the alluvial	No adverse effect



Attribute	Target	Analysis	Evaluation
		woodland. Works for the construction of the new outfall will involve some clearance of the currently poorly developed ground layer and potentially some damage to 2no. mature willows which form a very narrow band of alluvial woodland at the riverbank. However, as noted above, this temporary disturbance is similar to what may occur during a severe flood, i.e. physical disturbance to trees and understorey vegetation, which is one of the critical natural processes influencing vegetation structure in this habitat.	
Woodland structure: community diversity and extent	Maintain diversity and extent of community types	The proposed development does not provide for any change to the diversity or extents of alluvial woodland community types, whether inside or outside the SAC.	No adverse effect
Woodland structure: natural regeneration	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	The only aspect of the proposed development that could affect the presence of young trees in the alluvial woodland is disturbance during the construction of the new outfall. However, as noted above, this temporary disturbance is similar to what may occur during a severe flood, which is one of the critical natural processes influencing vegetation structure in this habitat. There will be no permanent loss of alluvial woodland habitat or ongoing disturbance that would prevent the growth of seedlings, saplings or poles into canopy trees.	No adverse effect
Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	As detailed in Section 6.6 above, the proposed development will not have any perceptible effects on hydrological regime or hydromorphology in the operational phase, while such effects during construction are as follows: in the very worst-case scenario (cofferdam in place, 5%ile flow + climate change), maximum increase in flow velocity of 0.14-0.16m/s on the right (western) bank of the river (in parts of the channel velocities are unaffected or reduced); mean change over this cross-section is +0.03m/s; limited to within 40m upstream and 70m downstream of outfall works; in the same scenario, water level upstream is	No adverse effect



Attribute	Target	Analysis	Evaluation
		predicted to increase by c. 1cm, downstream to decrease by c. 1cm (restricted to within c. 100m of outfall works). Such minor changes over a localised extent and limited to the duration of the construction stage will not alter the prevailing hydrological regime in any example of this habitat.	
Woodland structure: dead wood	At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	The proposed development does not involve any removal of dead wood from the alluvial woodland. Therefore, there will be no effect on this feature of the habitat.	No adverse effect
Woodland structure: veteran trees	No decline	Within the alluvial woodland, the only mature trees that may sustain any impact are the 2no. mature willows (T59 and T60) on the riverbank either side of the new outfall headwall. There may be some damage to these trees during construction that, in the absence of protective measures, could lead to their loss. This would represent a decline in the number of veteran trees. Therefore, mitigation is required to avoid this potential adverse effect.	Potential adverse effect
Woodland structure: indicators of local distinctiveness (sic)	No decline	NPWS (2025b) states that this includes ancient or long-established woodlands, archaeological and geological features as well as Red-listed and other rare or localised species. The alluvial woodland adjoining the proposed development is not an ancient or long-established woodland and is not known to contain any features of particular archaeological or geological interest. The survey carried out by expert botanist Dr Mary O'Connor did not identify any Red-listed or other rare or localised flora in the area in question. Therefore, there will be no effects on this Attribute.	No adverse effect



Attribute	Target	Analysis	Evaluation
Vegetation composition: typical species	A variety of typical native species present, depending on woodland type, including ash (<i>Fraxinus excelsior</i>) alder (<i>Alnus glutinosa</i>), willows (<i>Salix</i> spp) and locally, oak (<i>Quercus robur</i>)	Given that there will be no loss of any trees from the alluvial woodland and that trees to be cleared from the adjoining non-Annex I areas include a high proportion of non-typical or negative indicator species, e.g. Sycamore, there will be no adverse effect on vegetation composition.	No adverse effect
Vegetation composition: negative indicator species	Negative indicator species, particularly non-native invasive species, absent or under control	NPWS (2025b) states that the most common negative indicator species for this habitat include Sycamore (<i>Acer pseudoplatanus</i>), Beech (<i>Fagus sylvatica</i>), Rhododendron (<i>Rhododendron ponticum</i>), Cherry Laurel (<i>Prunus laurocerasus</i>), Dogwood (<i>Cornus sericea</i>), Himalayan Honeysuckle (<i>Leycesteria formosa</i>) and Himalayan Balsam (<i>Impatiens grandiflora</i> ; sic, presumably <i>I. glandulifera</i> was intended). During the construction phase, works for the installation of the new outfall will interact with two non-native invasive species of concern, namely Himalayan Balsam and Japanese Knotweed. In the absence of appropriate control measures, the works have the potential to cause further spread of these species within the habitat.	Potential adverse effect from construction-related invasive species risks



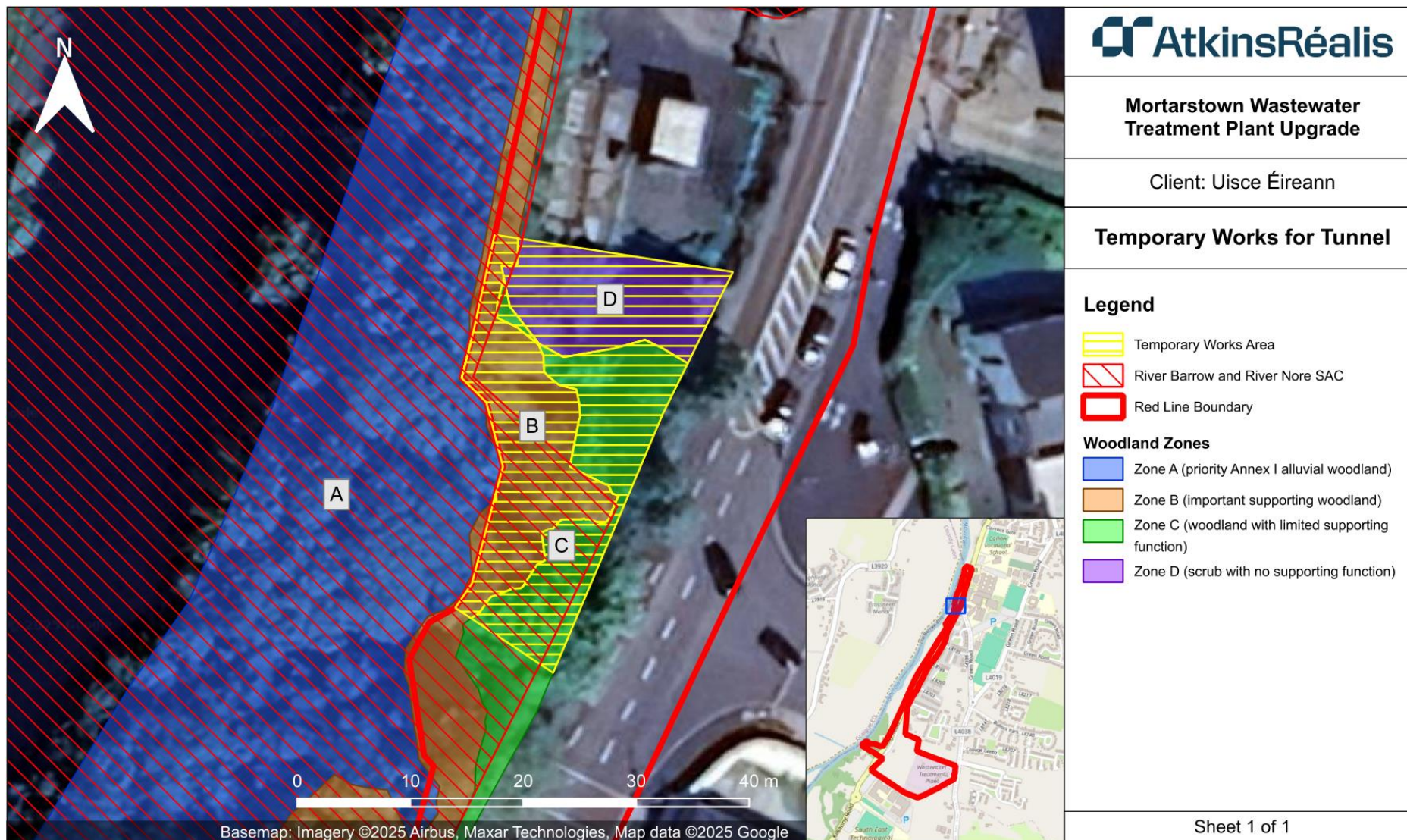


Figure 8-1 - Maximum extent of temporary works area south of the existing Pumping Station.

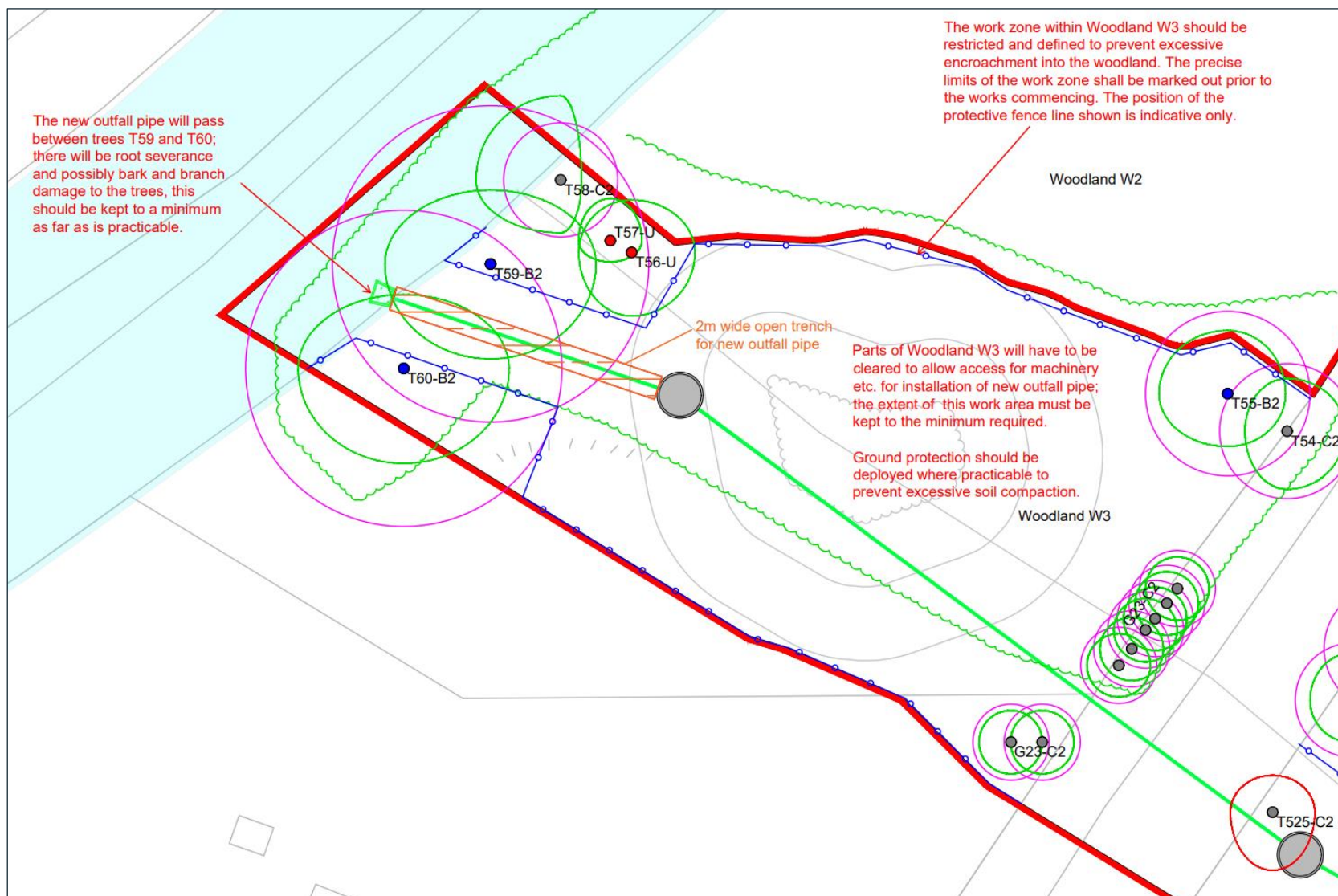


Figure 8-2 - Impacts to woodland and riparian trees near the outfall works (from Tree Protection Plan Drawing No. 25025_TPP Sheet 2, full scale version in Appendix H).

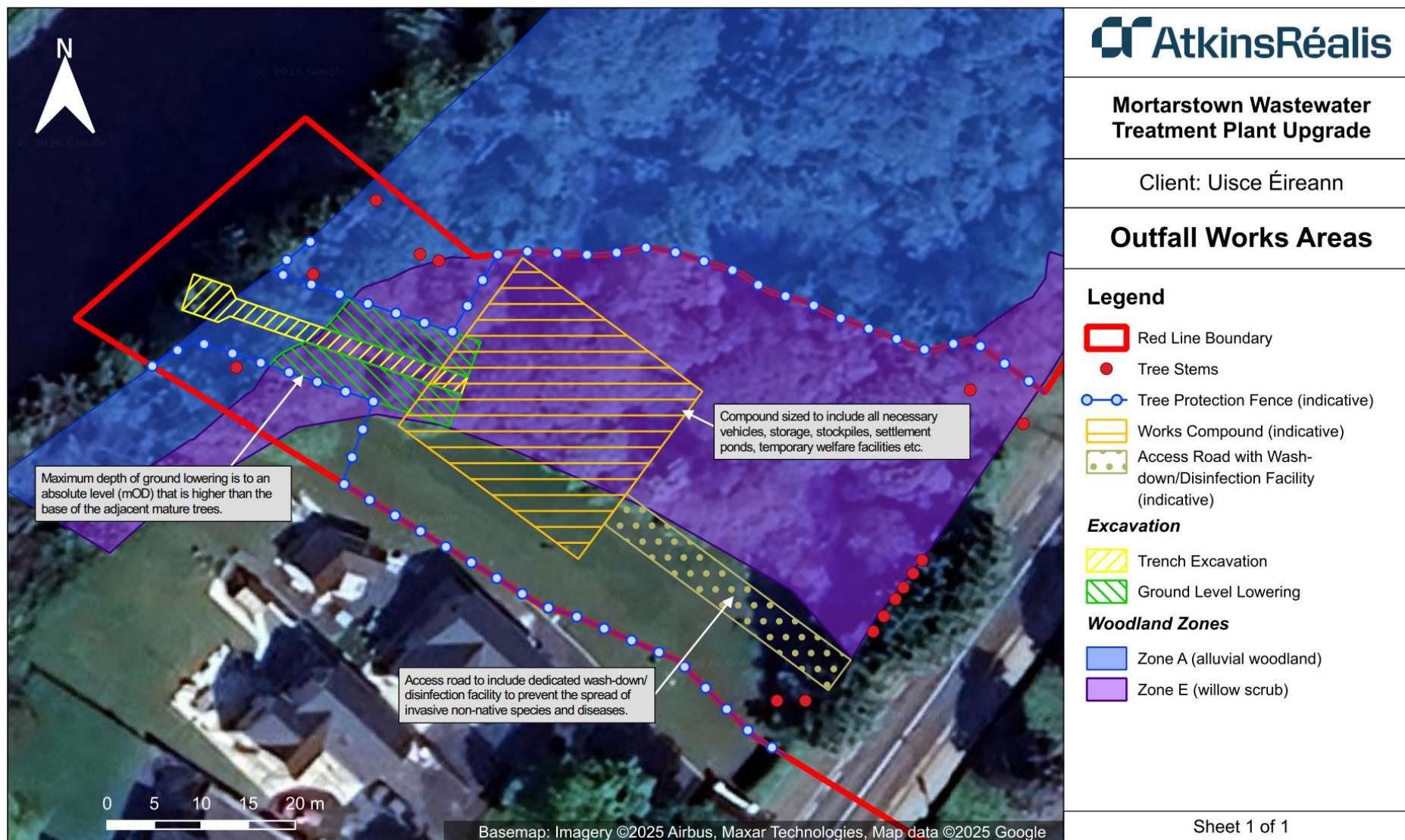


Figure 8-3 - Indicative extents of temporary works areas for the proposed new outfall.

8.2.4 White-clawed Crayfish

As noted in Section 5.3.4, White-clawed Crayfish is known historically from the River Barrow near the proposed development, but no evidence of its presence was recorded during the aquatic surveys and its status is uncertain following an outbreak of crayfish plague in the Barrow catchment in 2017. This assessment has been undertaken on the precautionary assumption that this species is present near the proposed development or could recolonise this section of the river in the future.

The site-specific conservation objective for White-clawed Crayfish is to “maintain” its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-5 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

In addition, it is noted that construction works for the proposed development are likely to include artificial lighting of the works areas. This may include the in-stream works area for the construction of the new outfall headwall. As explained in Section 6.3 above, artificial lighting at night can negatively affect species, especially those that are mainly nocturnal, such as White-clawed Crayfish. There will be no artificial lighting of the river channel during the operational phase.

Unlike fish, which have swim bladders, crayfish lack air-filled cavities and so are primarily sensitive to the particle motion component of sound rather than the pressure component. Only crayfish in the immediate vicinity of active piling are at risk of lethal effects. Crayfish at greater distances may suffer sub-lethal injuries. However, the beginning of piling will likely induce an escape response, allowing them to move further away and avoid injury. Any mortality would be extremely localised. Given that piling is limited to between the hours of 08:00 and 18:00 for a period of c. 10 days, displacement and barrier effects would be temporary and slight to moderate at the local level.

On the basis of the assessment in Table 8-5, there are potential adverse effects on this conservation objective in terms of water quality arising from construction activities and the risk of introducing crayfish plague during in-stream works. Therefore, mitigation is required for construction-phase water quality impacts and biosecurity risks. Mitigation is also required to control artificial lighting during the construction phase.



Table 8-5 - Analysis and evaluation of effects on White-clawed Crayfish. Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Distribution	No reduction from baseline. See map 7	The proposed development does not have any potential to alter or restrict the distribution of White-clawed Crayfish.	No adverse effect
Population structure: recruitment	Juveniles and/or females with eggs in at least 50% of positive samples	The proposed development does not have any potential to alter the structure of White-clawed Crayfish population in the Barrow catchment or reduce the absolute or relative abundances of juvenile or berried female crayfish in the catchment.	No adverse effect
Negative indicator species	No alien crayfish species	The proposed development is extremely unlikely to facilitate the introduction of non-native crayfish species to the River Barrow.	No adverse effect
Disease	No instances of disease	In-stream works for the installation of the new outfall headwall present a risk of spreading aphanomycosis ("crayfish plague") or other diseases that affect crayfish. If crayfish are present and crayfish plague were re-introduced, this would risk a profound negative effect on the population in the Barrow catchment.	Potential adverse effect from construction-related biosecurity risks
Water quality	At least Q3-4 at all sites samples by the EPA	As identified in Section 6.5.1 above, the construction of the proposed development, especially excavations, earthworks and in-stream works, have the potential to cause negative impacts on water quality, mainly through input of fine sediment and other materials, e.g. hydrocarbons and cement-based products, in surface water run-off from works areas. Given the likely magnitude, extent and duration of these impacts, they are unlikely to affect Q-values, which reflect longer-term trends in water quality. Furthermore, given the relative tolerance of crayfish to these types of water quality impacts, they are considered to represent slight to imperceptible short-term negative effects on this species. Nevertheless, it is considered prudent to prescribe mitigation to protect water quality during the construction stage to avoid adverse effects in this regard. The most recent (2023) Q-values for the next three EPA monitoring stations downstream from the WwTP are all Q3-4 (<i>EPA Maps: Water</i>). This is consistent with the current WFD stats of 'Moderate' for this section of the River Barrow. The proposed upgraded WwTP has been designed and its ELVs set to ensure that it does not prevent the achievement of 'Good' status by 2027. Therefore, the	Potential adverse effect from construction-phase water quality impacts



Attribute	Target	Analysis	Evaluation
		operation of the proposed development will not lead to water quality falling below Q3-4, as defined by the EPA.	
Habitat quality: heterogeneity	No decline in heterogeneity or habitat quality	From the results of the aquatic surveys detailed in Triturus (2025), the aquatic habitat adjoining the proposed development is not particularly heterogeneous in terms of flow types, substrate or in-channel features. The installation of the new outfall will lead to a direct loss of a very small area of potentially suitable habitat for crayfish from within the river channel (c. 130m ² within the cofferdam during construction, thereafter reducing to 5m ² occupied by the headwall). This represents a miniscule portion of this habitat type in the locality. The assessment of hydromorphological impacts summarised in in Section 6.6 shows that there will be no indirect loss or deterioration of crayfish habitat.	No adverse effect



8.2.5 Sea Lamprey, Brook Lamprey and River Lamprey

The site-specific conservation objectives for Sea Lamprey, Brook Lamprey and River Lamprey are to “restore” the favourable conservation condition of these species, which is defined by the Attributes and Targets set out in Table 8-6 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets. Given the high degree of commonality in the Attributes and Targets of the conservation objectives for these species, they are combined in this table, with any differences noted.

In addition, it is noted that construction works for the proposed development are likely to include artificial lighting of the works areas. This may include the in-stream works area for the construction of the new outfall headwall. As explained in Section 6.3 above, artificial lighting at night can negatively affect species, including aquatic species such as lampreys. There will be no artificial lighting of the river channel during the operational phase.

As explained in Section 6.3 above, modelling by Wave Dynamics (2026) (see Appendix I to this NIS) found that, in the worst-case scenario (impact/percussive pile driving), even the most sensitive receptors (juvenile hearing-specialist fish such as Twaite Shad) would only experience temporary hearing injury if they remain within 12m of active piling for at least 10 minutes, while behavioural responses could be induced up to 700m from the activity. Juvenile Twaite Shad are only found in the tidal sections of the river and adults are also unlikely to be found as far upstream as the proposed development. No other hearing specialist species is known from the River Barrow. As such, only hearing generalist species are likely to occur and, given the lack of suitable spawning and juvenile habitat in the vicinity, will likely to be limited to larger fish moving through the area. In addition, piling is limited to between the hours of 08:00 and 18:00 for a period of c. 10 days. Therefore, even temporary hearing injury is extremely unlikely, with effects on fish limited to temporary avoidance of the area during active piling. This is considered to be a temporary slight to moderate negative impact at the local level.

On the basis of the above and the assessment in Table 8-6, the only potential for adverse effects on Sea Lamprey, Brook Lamprey or River Lamprey relates to disturbance arising from artificial lighting and underwater noise and vibration from in-stream works for the new outfall. Therefore, mitigation is required to control construction-phase lighting and underwater noise. In addition, proper site hygiene and biosecurity is required to control the risk of introducing diseases that could affect fish populations.



Table 8-6 - Analysis and evaluation of effects on Sea Lamprey, Brook Lamprey and River Lamprey. Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Distribution: extent of anadromy (Sea Lamprey and River Lamprey) Distribution (Brook Lamprey)	Greater than 75% of main stem length of rivers accessible from estuary (Sea Lamprey) Access to all watercourses down to first order streams (Brook Lamprey) Greater than 75% of main stem and major tributaries down to second order accessible from estuary (River Lamprey)	The proposed development does not provide for any new barriers to migration of lampreys on any watercourse. Furthermore, as explained in Section 6.6, there will be no change in flow velocities that would hinder the movement of lampreys or other fish species as part the proposed development.	No adverse effect
Population structure of juveniles	At least three age/size groups present (Sea Lamprey) At least three age/size groups of brook/river lamprey present	Given the small magnitude, localised extents and short duration of construction-phase impacts and the absence of any significant operational-phase impacts on fish, the proposed development will not lead to any reduction in the number of age/size classes of any lamprey species present at any location or catchment-wide.	No adverse effect
Juvenile density in fine sediment	Juvenile density at least 1/m ² (Sea Lamprey) Mean catchment juvenile density of brook/river lamprey at least 2/m ²	Given the small magnitude, localised extents and short duration of construction-phase impacts and the absence of any significant operational-phase impacts on fish, the proposed development will not lead to any reduction in the densities of juvenile lampreys in fine sediment at any location or catchment-wide.	No adverse effect
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	As noted in Section 5.3.3, there is no suitable spawning habitat for lampreys in the vicinity of the proposed development and the main channel of the River Barrow is generally poor in terms of spawning habitat. Given the very limited impacts from the proposed development, it will not lead to any reduction in the extent or distribution of lamprey spawning beds.	No adverse effect
Availability of juvenile habitat	More than 50% of sample sites positive	As noted in Section 5.3.3, there is no suitable nursery habitat for lampreys in the vicinity of the proposed development and the main channel of the River Barrow is generally poor in terms of nursery habitat. Given the very limited	No adverse effect



Attribute	Target	Analysis	Evaluation
		impacts from the proposed development, it will not lead to any reduction in the extent or distribution of lamprey juvenile habitat.	



8.2.6 Twaite Shad

The site-specific conservation objective for Twaite Shad is to “restore” its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-7 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

On the basis of the assessment in Table 8-7, there is no potential for adverse effects on Twaite Shad, which is not likely to occur within 50km of the proposed development. Therefore, mitigation is not required for this species.



Table 8-7 - Analysis and evaluation of effects on Twaite Shad. Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	The proposed development does not provide for any new barriers to the movement of Twaite Shad or other fish species along the River Barrow. On the River Barrow, Twaite Shad is not known to migrate further upstream than St Mullins, c. 50km downstream of the proposed development.	No adverse effect
Population structure: age classes	More than one age class present	Twaite Shad is an anadromous species. The adults spawn in suitable gravels just upstream of the tidal limits of large rivers. The juveniles spend two years moving up and down the estuary with the tides before maturing and moving out to coastal waters. Thus, this Attributes relates to the estuarine portion of the SAC, >50km downstream from the proposed development. Given this vast distance and the scale of the construction- and operational-phase water quality impacts associated with the proposed development, as described in Section 6.5, it will not affect the presence of multiple age classes of Twaite Shad in the River Barrow.	No adverse effect
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning habitats	As noted above, Twaite Shad is not known from further upstream than St Mullins, which is just upstream of the tidal limit of the River Barrow, c. 50km downstream from the proposed development. Thus, spawning is likely concentrated in the vicinity of St Mullins. Given this vast distance and the scale of the construction- and operational-phase water quality impacts associated with the proposed development, as described in Section 6.5, it will not affect the extent of distribution of these spawning habitats.	No adverse effect
Water quality: oxygen levels	No lower than 5mg/l	As noted above, Twaite Shad is not known from further upstream than St Mullins, which is just upstream of the tidal limit of the River Barrow, c. 50km downstream from the proposed development. Given this vast distance and the scale of the construction- and operational-phase water quality impacts associated with the proposed development, as described in Section 6.5, it will not affect oxygen levels in shad waters.	No adverse effect
Spawning habitat quality: Filamentous	Maintain stable gravel substrate with very little fin material, free of filamentous algal (macroalgal)	As noted above, Twaite Shad is not known from further upstream than St Mullins, which is just upstream of the tidal limit of the River Barrow, c. 50km downstream from the proposed development. Thus, spawning is	No adverse effect



Attribute	Target	Analysis	Evaluation
algae; macrophytes; sediment	growth and macrophyte (rooted higher plants) growth	likely concentrated in the vicinity of St Mullins. Given this vast distance and the scale of the construction- and operational-phase water quality impacts associated with the proposed development, as described in Section 6.5, it will not affect the quality of these spawning habitats.	



8.2.7 Salmon

The site-specific conservation objective for Salmon is to “restore” its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-8 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

In addition, it is noted that construction works for the proposed development are likely to include artificial lighting of the works areas. This may include the in-stream works area for the construction of the new outfall headwall. As explained in Section 6.3 above, artificial lighting at night can negatively affect species, including aquatic species such as Salmon, which rely on cues such as light to time their movements and migrations. There will be no artificial lighting of the river channel during the operational phase.

As explained in Section 6.3 above, modelling by Wave Dynamics (2026) found that, in the worst-case scenario (impact/percussive pile driving), even the most sensitive receptors (juvenile hearing-specialist fish such as Twaite Shad) would only experience temporary hearing injury if they remain within 12m of active piling for at least 10 minutes, while behavioural responses could be induced up to 700m from the activity. Juvenile Twaite Shad are only found in the tidal sections of the river and adults are also unlikely to be found as far upstream as the proposed development. No other hearing specialist species is known from the River Barrow. As such, only hearing generalist species are likely to occur and, given the lack of suitable spawning and juvenile habitat in the vicinity, will likely to be limited to larger fish moving through the area. In addition, piling is limited to between the hours of 08:00 and 18:00 for a period of c. 10 days. Therefore, even temporary hearing injury is extremely unlikely, with effects on fish limited to temporary avoidance of the area during active piling. This is considered to be a temporary slight to moderate negative impact at the local level.

On the basis of the assessment in Table 8-8, there are potential adverse effects on this conservation objective in terms of water quality, especially sedimentation, arising from construction activities. Therefore, mitigation is required for construction-phase water quality impacts. Mitigation is also required to control the use of artificial lighting during the construction phase. In addition, proper site hygiene and biosecurity is required to control the risk of introducing diseases that could affect fish populations.



Table 8-8 - Analysis and evaluation of effects on Salmon. Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	The proposed development does not provide for any new barriers to migration of Salmon on any watercourse. Furthermore, as explained in Section 6.6, there will be no change in flow velocities that would hinder the movement of Salmon or other fish species as part the proposed development.	No adverse effect
Adult spawning fish	Conservation limit (CL) for each system consistently exceeded	The proposed development does not provide for any removal of adult Salmon from the River Barrow. Therefore, the proposed development will not cause any failure of the system to reach or exceed the CL for Salmon.	No adverse effect
Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	Given the very localised impacts of the proposed development, it does not have any potential to affect the mean catchment-wide fry abundance.	No adverse effect
Out-migrating smolt abundance	No significant decline	Given the localised impacts of the proposed development and the short duration of the construction phase, it does not have any potential to cause a significant decline in the abundance of out-migrating smolts.	No adverse effect
Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	As noted in Section 5.3.3, the riverbed in the vicinity of the proposed development is not suitable for Salmon spawning. As such there will be no direct loss of redds. As explained in Section 6.6, the proposed development does not provide for any hydrological or hydromorphological impacts that could indirectly cause a decline in the number or distribution of spawning redds, e.g. through scour. The only potential impact on redds associated with the proposed development is smothering of downstream spawning gravels by fine sediments in surface water run-off from excavations, earthworks or other works areas during construction.	Potential adverse effect from input of fine sediment during construction
Water quality	At least Q4 at all sites sampled by the EPA	As identified in Section 6.5.1 above, the construction of the proposed development, especially excavations, earthworks and in-stream works, have the potential to cause negative impacts on water quality, mainly through input of fine sediment and other materials, e.g. hydrocarbons and cement-based	Potential adverse effect from construction-phase water quality impacts



Attribute	Target	Analysis	Evaluation
		products, in surface water run-off from works areas. Given the likely magnitude, extent and duration of these impacts, they are unlikely to affect Q-values, which reflect longer-term trends in water quality. Nevertheless, it is considered prudent to prescribe mitigation to protect water quality during the construction stage to avoid adverse effects in this regard. The most recent (2023) Q-values for the next three EPA monitoring stations downstream from the WwTP are all Q3-4 (<i>EPA Maps: Water</i>). This is consistent with the current WFD stats of 'Moderate' for this section of the River Barrow. The proposed upgraded WwTP has been designed and its ELVs set to ensure that it does not prevent the achievement of 'Good' status (equivalent to Q4) by 2027. Therefore, the operation of the proposed development will not prevent the achievement of the target of Q4 for Salmon.	



8.2.8 Otter

The site-specific conservation objective for Otter is to “restore” its favourable conservation condition, which is defined by the Attributes and Targets set out in Table 8-9 below. This table presents an analysis and evaluation of the effects of the proposed development on each of those Attributes and Targets.

In addition, it is noted that construction works for the proposed development are likely to include artificial lighting of the works areas. As explained in Section 6.3 above, artificial lighting at night can negatively affect species, especially those that are mainly nocturnal, such as Otter. As in-stream works and works on the riverbank, i.e. works for the construction of the new outfall, are limited to the months of July, August and September, the normal working hours of 08:00 to 18:00 will not require any artificial lighting. However, in the very unlikely event that such works must be undertaken outside of this period, it is considered prudent to provide mitigation to explicitly restrict all such works to daylight hours. There will be no artificial lighting of Otter habitats during the operational phase.

As explained in Section 6.3, it is extremely unlikely that any otters would be exposed to underwater noise which could cause even temporary hearing injury. However, intense noise from sheet piling to install the temporary cofferdam for the outfall works could cause significant disturbance to Otters, causing individuals to leave the area and/or deter them from moving along the river corridor past the active works (an effective barrier to connectivity). However, this impact is highly localised (c. 150m radius from active piling) and limited to periods when piling is actively taking place, i.e. between the hours of 08:00 and 18:00 over a period of c. 10 days, which itself is restricted to the permitted season for in-stream works (1st July to 30th September), and even on days when piling is taking place it will not be continuous as there will be pauses for set-up, alignment and checking of piles. As such, there will be no impact during dusk, dawn or at night, when otters are most active, or during pauses in piling activity. Thus, the probability of otters being exposed to this impact is very low. Furthermore, given the localised extent and timing of the impact, it is extremely unlikely that more than one or a small number of otters would be exposed. The effective exclusion of otters from the affected area will be fully reversed on cessation of active piling. Given the short duration, restricted timing, and localised extent of the impact, as well as the full reversal of the impact on completion of the works concerned, the likely effect on Otter is temporary and moderate at the local level.

On the basis of the above and the assessment in Table 8-9, there are potential adverse effects on this conservation objective in terms of potential disturbance to Otter during the construction of the new outfall. Therefore, mitigation is required for construction-phase disturbance.



Table 8-9 - Analysis and evaluation of effects on Otter. Attributes and Targets from NPWS (2025b).

Attribute	Target	Analysis	Evaluation
Distribution	No significant decline	Given the nature of the proposed development, it does not have any potential to limit or restrict the distribution of Otter. Therefore, it will not cause a decline in Otter distribution in the SAC.	No adverse effect
Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around ponds	The proposed development does not provide for any permanent loss of riparian or other habitat for Otter. During the construction phase, works for the construction of the new outfall will extend to the riverbank and will involve temporary land-take and activities with potential for noise and visual disturbance to otters. This will exclude otters from the immediate vicinity of these works, which represents an effective barrier to connectivity for otters during active works. However, these activities will be of generally low intensity, limited extent, relatively short duration (c. 3 weeks) and occur mostly during daylight hours (outside of the main activity period of Otter). The dense woodland vegetation along the riverbanks also provides a degree of inherent screening/attenuation of noise and visual impacts. Therefore, any effect would be moderate and temporary or short-term. Nevertheless, it is considered prudent to prescribe mitigation to control and minimise these impacts.	Potential adverse effect due to construction-related disturbance
Extent of marine habitat	No significant decline. Area mapped and calculated as 857.7ha	The propose development does not provide for any direct or indirect impacts on marine habitats for Otter or any other species.	No adverse effect
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 616.6km	The installation of the new outfall will lead to a direct loss of a very small area of river habitat (c. 130m ² within the cofferdam during construction, thereafter reducing to 5m ² occupied by the headwall). This represents a very small part of the river width at this location and is entirely negligible in terms of the river length. Furthermore, there is no severance of the river corridor due to the presence of either the temporary cofferdam or the permanent headwall. As such, this will not represent any loss of river habitat for Otter.	No adverse effect



Attribute	Target	Analysis	Evaluation
Extent of freshwater (lake) habitat	No significant decline. Area mapped and calculated as 2.6ha	The propose development does not provide for any direct or indirect impacts on lake habitats for Otter or any other species.	No adverse effect
Couching sites and holts	No significant decline	No holts or couches were identified in the immediate vicinity of the outfall or existing WwTP. Thus, based on the current baseline, there will be no loss of any holt or couch. However, given the confirmed presence of otters in the vicinity and the significant time likely to elapse between the surveys which informed this NIS and the commencement of works, the possibility that otters may establish new holts or couches in the affected area cannot be entirely excluded.	Potential adverse effect arising from uncertainty due to possible changes in the baseline between assessment and works commencing
Fish biomass available	No significant decline	Given the small magnitude, localised extents and short duration of construction-phase impacts and the absence of any significant operational-phase impacts on fish, the proposed development will not lead to a significant decline in the availability of fish biomass as prey for Otter.	No adverse effect



8.2.9 Summary

On the basis of the preceding sub-sections, mitigation is required for the following impacts in order to avoid adverse effects on the relevant conservation objectives:

- 'Vegetation of flowing waters'
 - Construction-phase water quality impacts, and
 - Construction-related invasive species risks.
- 'Hydrophilous tall herb swamp'
 - Construction-related invasive species risks.
- '*Alluvial woodland'
 - Potential loss of up to 2no. veteran trees, and
 - Construction-related invasive species risks.
- White-clawed Crayfish
 - Construction-phase water quality impacts,
 - Construction-phase artificial lighting, and
 - Biosecurity risks, namely crayfish plague.
- Sea Lamprey, Brook Lamprey and River Lamprey
 - Construction-phase artificial lighting,
 - Underwater noise and vibration from piling, and
 - Biosecurity risks, i.e. diseases that could affect fish populations.
- Salmon
 - Construction-phase water quality impacts,
 - Construction-phase artificial lighting,
 - Underwater noise and vibration from piling,
 - Biosecurity risks, i.e. diseases that could affect fish populations.
- Otter
 - Construction-phase disturbance at the outfall works.

As such, there are four principal controls required, all during the construction stage: water quality, artificial lighting, noise and biosecurity.



9. Mitigation

9.1 Requirement and Approach

As demonstrated above, the proposed development has the potential to adversely affect several qualifying interests of the River Barrow and River Nore SAC, in view of their conservation objectives. Therefore, this NIS prescribes mitigation measures to control impacts from the proposed development and, thereby, prevent such effects.

The development of the mitigation measures prescribed in this section has followed the “mitigation hierarchy”, which prioritises avoidance over reduction, and actions at source over pathway over receptor, as follows: -

1. Eliminate the source of the impact,
2. Minimise or reduce the impact at its source,
3. Block or weaken the pathway for effects, and
4. Abate effects at the receptor.

This approach assists with more complete removal of the effects, minimises the risk of effects occurring by less obvious pathways, also protects non-target receptors, and minimises the risks of unintended harm associated with measures focussed at or near the receptors.

9.2 Mitigation Measures

9.2.1 Construction Phase

This section details the mitigation measures which will be implemented by the Contractor during the construction phase. These measures shall be incorporated into the Contractor’s Method Statement.

Indicative locations, extents and layouts of the construction compounds are illustrated in Drawings No. 5161805_EWE_DR_MOR_5600 to 5161805_EWE_DR_MOR_5604 in Appendix G to this NIS. As can be seen from these drawings, there are large areas within the Red Line Boundary that are unused for the permanent infrastructure but will be available to the Contractor for use during construction. As such, there is ample suitable space for all of the measures prescribed in this section, even when certain restrictions (e.g. minimum distances from watercourses, or tree protection zones) are taken into account. Therefore, it has not been necessary to prescribe the exact location, extents or layouts of these measures.

9.2.1.1 General Precautions

The following overarching measures shall apply to the construction phase: -

1. All works shall be undertaken within the agreed site boundary. No works shall be undertaken outside the site boundary.
2. As part of site induction, all persons entering the works area shall receive a ‘tool-box talk’ covering the environmental and ecological sensitivities of the site and the measures being implemented to avoid and minimise impacts on those sensitivities, as well as the responsibilities of persons on site in implementing those measures.
3. Working hours shall be restricted to between 08:00 and 18:00, to minimise the risk of disturbance to species.



9.2.1.2 Ecological Supervision

The Contractor shall retain the services of a suitably qualified and experienced ecologist for the duration of the works.

The qualifications and experience of the Contractor's ecologist shall include, as a minimum: -

- BSc (Hons) or above in Ecology or a related environmental discipline,
- Full membership of the CIEEM or equivalent membership of a similar professional body,
- Demonstrable experience in providing ecological/environmental supervision on construction sites, including where there are in-stream works.

The main duties of the Contractor's ecologist shall include the following: -

1. Assist the Contractor in ensuring that the measures in this NIS, any conditions of consents/licences and relevant guidelines are fully and properly implemented during construction.
2. Undertake pre-construction surveys for breeding or resting places of species listed on Annex IV to the Habitats Directive, most notably Otter and bats, as well as nesting birds and invasive non-native plant species.
3. Oversee the continued implementation of the biosecurity measures described below.
4. Advise the Contractor on any requirement for a derogation licence under Regulation 54 of the Habitats Regulations due to the presence of breeding or resting places of species listed on Annex IV to the Habitats Directive, if identified during the pre-construction surveys.²⁶
5. Directly supervise key activities on site, particularly works near sensitive ecological receptors such as the River Barrow, woodlands and potential bat roost features.
6. Carry out weekly inspections of the site and document the implementation of the measures in this NIS, any conditions of consents/licences and relevant guidelines. The Contractor's ecologist's inspection records shall be available to Uisce Éireann or the Employer's Representative, An Coimisiún Pleanála, the NPWS and IFI, on request.
7. Provide monthly updates to Uisce Éireann or the Employer's Representative on the implementation of the mitigation measures detailed in this NIS and any ecological/environmental incidents on site.

9.2.1.3 Water Quality

The following measures shall apply to prevent water quality impacts generally: -

1. During all stages of construction, site management shall ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the aquatic environment and the requirement to avoid pollution.
2. Safe handling of all potentially hazardous materials will be emphasised to all site personnel.

²⁶ The Contractor, with the assistance of the Contractor's ecologist, shall be responsible for applying for any such licence and observing its conditions.



3. Tools and equipment shall not be cleaned in any waterbody and wash water shall not be discharged directly into any waterbody or drain without appropriate treatment.
4. Prior to commencement of works, the appointed Contractor, with the assistance of the Contractor's ecologist/site environmental manager, shall elaborate detailed, project-specific Incident Response Plan (IRP). The IRP shall be consistent with the mitigation measures in this NIS and the EIAR, and approved by Uisce Éireann, and shall be adhered to in order to address any pollution incidents on site.
5. A designated member of the Contractor's team shall make daily checks for elevated water levels in all waterbodies adjoining the construction site, as well as weather warnings or flood alerts from Met Éireann, Carlow County Council and/or Laois County Council.
 - a. Should water levels in the River Barrow or overland flows pose a risk of overwhelming water quality control measures, or should a weather warning (Orange or Red level) for extreme rainfall or a flood alert covering the construction site be in place,
 - i. All areas of exposed soil shall be securely covered with hessian matting,
 - ii. All stockpiles shall also be securely covered, and
 - iii. Works carrying the greatest risk of pollution, i.e. works within the flood zone, shall be suspended and all vehicles, plant, equipment, construction materials and personnel shall be removed from the flood zone.
 - b. Works may resume once any flood waters have receded and any warning/alert been lifted.
 - c. Specific measures relating to the works to install the proposed new outfall are prescribed later in this section.

In addition, the measures in the following sub-sections, which have been taken largely from Chapter 12 Water of the EIAR which accompanies this NIS, shall apply to control the risk of water quality impacts from specific sources. These are tried-and-tested, best practice mitigation measures for the protection of surface and groundwater quality during the construction.

Surface Water Run-off

The following measures shall be implemented to minimise the quantity of surface water run-off from the works area²⁷, and to minimise any potential contamination of such run-off by fine sediment or other deleterious matter: -

1. At the beginning of site set-up, silt fences shall be erected down-gradient of the works areas and the Contractor's compound and where drains and drainage pathways are present.
 - a. The silt fences shall be formed using timber stakes and appropriate silt barrier membrane, embedded into the local soils to ensure all site water is captured and filtered.
 - b. All silt fences shall be inspected by the Contractor and their ecologist on set-up and, thereafter, on a daily basis by the Contractor and weekly by their ecologist. Silt fences shall be maintained in good condition and any defects shall be rectified as soon as they are identified.

²⁷ In this section, the "works area" includes the site compound, stockpiles and temporary settlement pond.



- c. The Contractor's ecologist shall directly monitor and keep records of the installation, checks, maintenance and removal of all silt fences and these records shall form part of regular reporting to the Employer and/or Employer's Representative.
2. All surface drains within and down-gradient of the works area shall be blocked temporarily or, where flows are minimal, silt fencing shall be placed within the existing drain.
3. Pumped construction water shall not be discharged directly into any surface waterbodies. Pumped water shall be discharged onto a vegetated surface, local to the excavation, via a silt bag that will filter any remaining sediment from the pumped water before infiltration to ground. The entire silt bag discharge area shall be enclosed by a perimeter of double silt fencing.
4. Daily monitoring of excavations/earthworks and associated water management shall be completed by a suitably qualified person (the Contractor's ecologist) during the construction phase. To allow for real-time monitoring, continuous turbidity meters shall be installed and trigger levels set, as follows (only required during works west of Kilkenny Road):
 - a. Continuous turbidity meters shall be installed upstream and immediately downstream of the proposed works. The meters shall be positioned in close proximity to the riverbank so as to record any increase from the works as early as possible.
 - b. To establish baseline conditions, monthly turbidity sampling shall be required for 12 months prior to start of works²⁸ (at the agreed construction-stage monitoring points). This baseline data shall be used to set trigger levels during construction. The trigger levels will be set relative to the upstream reading rather than absolute turbidity.
 - c. The continuous turbidity meters shall be installed and start recorded two weeks before the start of any works. The effectiveness of the trigger levels can be tested during this period and adjusted as necessary. The meters shall run continuously throughout the construction phase and for an additional two weeks post-construction.
 - d. Readings from the meters shall be transmitted to web-based data portal allowing live monitoring.
 - e. If trigger levels are reached, works shall stop as quickly and as safely possible. The Contractor's ecologist shall investigate the source of elevated levels. If a source is discovered the issue must be remedied as soon as possible. If no source can be found, works can commence once the downstream turbidity levels are in line with upstream. Works will restart gradually while both the works area and the turbidity readings are being monitored by the Contractor's ecologist.
 - f. If a pollution event occurs, the Contractor's ecologist shall notify the Project Manager, the Employer and/or Employer's Representative ecologist, the NPWS and IFI.
5. Earthworks shall be restricted to dry conditions and low rainfall to reduce run-off and potential sedimentation. In this regard, short-term rainfall data shall be acquired from Met Éireann each day before earthworks begin and shall be checked by a designated member of the Contractor's team at least every 2 hours while the work is ongoing. In addition, this designated person shall on a daily basis monitor weather warnings from Met Éireann and flood alerts from the OPW, Carlow County Council and Laois County Council. Earthworks shall not be

²⁸ The detailed design and tender phases are likely to last longer than the prescribed period for this pre-construction monitoring. Therefore, this monitoring can commence post-consent (e.g. as part of detailed site investigations) and be completed well in advance of construction starting.



undertaken while Orange or Red rainfall warnings or flood alerts are in effect over the works area, or if localised heavy rain is forecast. Heavy rain is defined as follows:

- Rainfall rate > 10mm/hour, i.e. high-intensity localised rainfall,
 - Rainfall > 25mm in a 24-hour period, i.e. heavy rainfall lasting most of the day, or
 - Total rainfall > monthly average recorded in 7 consecutive days, i.e. prolonged heavy rainfall.
6. Run-off from the works areas, site compound and material stockpiles shall be collected by a shallow toe drain or other means of collection, which shall discharge to a purpose-built temporary shallow settlement pond.
- a. The collection system and settlement pond shall be installed before the site compound and stockpiles.
 - b. A silt fence (as described above) shall be installed around the settlement pond. These silt fences shall also be subject to regular checks and maintenance, as described above.
 - c. Settlement ponds from the compound and stockpiling shall be checked on a daily basis by the Contractor's ecologist.
 - d. Sediment build-up shall be removed from the settlement pond at regular intervals and removed off-site.
 - e. The Contractor's ecologist shall directly monitor and keep records of checks and sediment removal from settlement ponds and these records shall form part of regular reporting to the Employer and/or Employer's Representative.
7. All stockpiles shall be located as far as possible (minimum 20m) from waterbodies and all stockpiles left overnight shall be covered.

In addition, the sands and gravels deposits associated with the Athy-Bagenalstown groundwater body are excellent filters and will polish treated construction water within a matter of metres of infiltration.

Dewatering of Excavations

Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network shall be undertaken as follows:

1. Appropriate interceptor drains shall be installed to prevent up-slope surface run-off from entering excavations. These drains shall discharge to vegetated surfaces downgradient of excavations and not directly to any surface waterbodies.
2. Water seeping into excavations shall be pumped out to temporary attenuation ponds adjacent to the excavation. Discharge to surface waterbodies shall not be permitted. Attenuation ponds shall discharge to vegetated areas and water will percolate to ground due to the permeable nature of the local soils and subsoils. The sand and gravel subsoils are excellent filters and will polish construction water within a matter of metres of infiltration.
3. Excavations shall be monitored daily by the Contractor's ecologist during construction. Should high volumes of groundwater seepage occur into the excavation, excavation shall immediately cease and a geotechnical assessment undertaken to identify an appropriate means of minimising seepage.

In relation to groundwater levels, water from excavations shall be pumped a short distance to settlement ponds where it will recharge to ground. Therefore, there will be no net change in groundwater volume, other than its displacement by a short distance during temporary dewatering.



Hydrocarbons

The following measures shall be implemented to control the risk of pollution from hydrocarbons, including fuels, hydraulic oils etc. on site: -

1. Storage of any fuels, oils and other hydrocarbons on site shall be kept to a minimum and restricted to secure tanks/containers, banded appropriately for the fuel storage volume (minimum 110% capacity) for the duration of construction.
2. Driving on site and shall be kept to a minimum.
3. All vehicles, plant, equipment etc. shall: -
 - a. Be free of any mechanical defects, and be well maintained so as to prevent fuel or oil leaks,
 - b. Be inspected and certified to ensure that they are leak-free and in good working order before arriving on site,
 - c. Be regularly inspected to ensure that they are leak-free and fit-for-purpose,
 - d. Not be left idling when not in use, and
 - e. Be parked/stored on drip trays overnight.
4. On-site re-fuelling of machinery shall be carried out using a mobile double-skinned fuel bowser. The fuel bowser shall be:
 - a. A double-axel custom-built refuelling trailer or truck,
 - b. Re-filled off-site and towed/driven around the site to where machinery is located,
 - c. Parked on a level area in the construction compound when not in use.
5. Only designated trained and competent operatives shall be authorised to refuel plant on site.
6. Mobile measures such as drip trays and spill kits shall be used during all refuelling operations.
7. Refuelling shall not be permitted within 50m of any waterbody.
8. The Contractor shall prepare and implement an Incident Response Plan (IRP) for the construction phase to deal with accidental spillages. The IRP shall form part of the Construction Environmental Management Plan and shall include, as a minimum, the measures in bullet points 9, 10 and 11 below.
9. All site personnel shall be familiar with their responsibilities under the IRP. In particular, all construction personnel shall be trained in the use of the spill containment/pollution control kits which shall be kept on site.
10. The following is the outline of the IRP required to be elaborated upon by the Contractor and implemented in the event of a spillage:
 - a. The source of the spill shall be identified and stopped.
 - b. The Environmental Manager and Contractor's ecologist shall be notified immediately.



- c. The spill shall be contained immediately using a spill control kit, ensuring not to spread the spilled substance within the wider environment.
 - d. If possible, vulnerable areas such as surface water drains shall be covered or isolated.
 - e. The spill shall be cleaned using spill control materials, which will be disposed of by a fully licenced waste contractor with the appropriate permits.
 - f. The Environmental manager will inspect the site to ensure that all measures are in place to prevent further spillage from occurring. Any storage areas are to be fully bunded and spill kits available to deal with accidental spillages; and
 - g. The Environmental Manager will notify the county council of the spillage and the remedial and preventative actions undertaken.
11. Additional drip trays and spill kits shall be accessible from the storage container. The 4×4 jeep/fuel truck shall also carry spill kits.
12. The electrical control building shall be bunded appropriately (110%) to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area shall be fitted with a storm drainage system and an appropriate hydrocarbon interceptor.

Cement-based Products

The following measures shall be implemented to control the risk of pollution from cement-based products on site:

- 1. Batching of wet cement products shall not occur on site. Pre-cast units, e.g. for culverts and other concrete elements, shall be used wherever possible and, where this is not possible, ready-mixed wet concrete shall be supplied to site.
- 2. Washing out of any plant used in concrete transport or concreting operations shall not be permitted on site.
- 3. Where concrete is delivered on site, only the chute shall be cleaned, using the smallest volume of water possible. Discharge of cement-contaminated waters to the construction-phase drainage system or directly to any artificial drain or watercourse shall not be permitted. Chute cleaning water shall be isolated in temporary lined wash-out pits located near proposed site compounds. These pits shall be removed at the end of the construction phase.
- 4. Concrete pouring shall be restricted to dry conditions and low rainfall. In this regard, short-term rainfall data shall be acquired from Met Éireann each day before earthworks begin and shall be checked by a designated member of the Contractor's team at least every 2 hours while the work is ongoing. In addition, this designated person shall on a daily basis monitor weather warnings from Met Éireann and flood alerts from the OPW, Carlow County Council and Laois County Council. Concrete pouring shall not be undertaken while Orange or Red rainfall warnings or flood alerts are in effect over the works area, or if localised heavy rain is forecast, as defined above under 'Surface Water Run-off'.
- 5. Concrete pour sites shall be free of standing water.
- 6. Plastic covers shall be kept ready for use in the event of unforeseen rain during or shortly before or after concrete pouring.

Construction of New Outfall

In addition to the measures already prescribed for the entirety of construction works for the proposed development, the following measures apply specifically to the works to install the proposed new outfall:



1. As these are in-stream works, they are restricted to the period beginning on 1st July and ending on 30th September. Should works outside this period be unavoidable, Carlow County Council (on behalf of Uisce Éireann) would need to apply for a derogation under the Local Authorities (Works) Act, 1949 (as amended) from the Inland Fisheries Section of the Department of Climate, Energy and the Environment.
2. A temporary cofferdam will be required to isolate the works for the installation of the new outfall from the surrounding river waters. The erection and removal of the cofferdam over a short period of time (c. 10 days) will ensure that any effects relating to elevated concentrations of suspended solids arising from the disturbance of the riverbed will be brief.
3. The barge that will be used during the installation of the sheet piling for the temporary cofferdam shall:
 - a. Be free of any mechanical defects, and be well maintained so as to prevent fuel or oil leaks,
 - b. Be inspected and certified to ensure that it is leak-free and in good working order before arriving on site, and
 - c. Not be left idling when jacked up/fixed in position.
4. Following the recommendations in the Hydrodynamic Technical Report (Appendix H), the cofferdam shall be erected to a level of at least +46.25mOD, which is 2.52m above the 5%ile plus climate change and 0.68m above the 50% AEP plus climate change.
5. The isolated area within the cofferdam shall be dewatered as described above in relation to dewatering of excavations. The pump intake shall be fitted with a screen or mesh to prevent intake of any fish or other aquatic life. Any fish (and crayfish, if present) within the isolated area shall be rescued by a suitably qualified and licensed person under the supervision of the Contractor's ecologist and released into the river outside the cofferdam.
6. In addition to the measures already described above in relation to the monitoring of weather conditions, response to rainfall events and management of works areas, the following measures from the Hydrodynamic Technical Report (Appendix H) apply specifically to the outfall works:
 - a. Short-term rainfall data shall be acquired from Met Éireann each day before outfall works begin and shall be checked by a designated member of the Contractor's team at least every 2 hours while the work is ongoing. If a significant rainfall event, as defined above under 'Surface Water Run-off', is forecast in the River Barrow catchment area which could result in a flood event, outfall works shall be postponed/suspended.
 - b. An automated system which records river water levels immediately upstream of the proposed outfall shall be installed before outfall works begin. The system shall be capable of sounding a loud and clear warning once water levels within the River Barrow reach a level of +44.42mOD (1m below the peak 50% AEP fluvial flood event; 1.83m below the minimum cofferdam height). The automated system shall be checked and serviced regularly by a competent person to ensure it is calibrated and working correctly.
 - c. The Contractor shall determine what level of exceedance they deemed to be acceptable, taking into account the time needed to remove the equipment located within the channel and flood zone in the event of the flood response being triggered.
7. Works at this location shall also follow *Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters* (IFI, 2016).

Micro-Tunnelling

The following measures apply specifically to the micro-tunnelling works for the new gravity sewer linking the site of the existing Kilkenny Road WwPS (to be decommissioned) to the site of the proposed new WwPS near the WwTP:



1. Before works commence, the works area shall be clearly marked out with fencing or flagging tape and silt fencing shall be erected as described above.
2. The area around the bentonite batching, pumping and recycling plant shall be bunded using geotextile fabric (as it will clog) and sandbags in order to contain any spillages.
3. Drilling fluid returns shall be contained within a sealed tank/sump to prevent migration from the works area. A closed-loop system shall be used to reduce the overall waste by separating the spoil/returns from the fluid, which can be recirculated and reused.
4. Any spills of drilling fluid shall be cleaned up immediately and contained in an adequately sized skip before being removed off-site.
5. Micro-tunnelling works shall be restricted to dry conditions and low rainfall. In this regard, short-term rainfall data shall be acquired from Met Éireann each day before earthworks begin and shall be checked by a designated member of the Contractor's team at least every 2 hours while the work is ongoing. In addition, this designated person shall on a daily basis monitor weather warnings from Met Éireann and flood alerts from the OPW, Carlow County Council and Laois County Council. Micro-tunnelling works shall not be undertaken while Orange or Red rainfall warnings or flood alerts are in effect over the works area, or if localised heavy rain is forecast, as defined above under 'Surface Water Run-off'.
6. Surface water (rainwater) collected on areas of disturbed ground shall be directed along a shallow swale and to a sump down-slope of the disturbed ground and pumped to an attenuation pond or silt bag in a percolation area, as described above.
7. Works areas, dewatering system and attenuation ponds/percolation areas shall be monitored daily by the Contractor's ecologist during construction. If high levels of silt or other contamination is noted, works shall be stopped and not recommence until the issue is resolved and the cause of the elevated source is remedied.
8. On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits shall be carefully reinstated and re-seeded (as specified for each location) at the earliest opportunity.
9. Batching of wet cement products shall not occur on site.

In addition, the following fracture blow-out (frac-out) prevention and contingency plan shall be observed:

1. The drilling fluid shall be non-toxic and naturally biodegradable. As such, Clear Bore Drilling Fluid or similar shall be used.
2. The area around the drilling fluid batching, pumping and recycling plants shall be bunded using geotextile fabric and/or sandbags to contain any potential spillage.
3. One or more lines of silt fencing shall be placed between the works area and the River Barrow.
4. Any spills of drilling fluid shall be cleaned up immediately and transported off-site for disposal at a licensed facility.
5. Adequately sized skips shall be used where temporary storage of arisings is required.
6. The drilling process and pressure shall be constantly monitored to detect any possible leaks or break-outs into the surrounding geology or waterbodies. This shall be gauged by observation and by monitoring the pumping rates and pressures.



7. In the event of any signs of frac-out, drilling shall be immediately stopped and:
 - a. Any frac-out material shall be contained and removed off-site.
 - b. The drilling location shall be reviewed, before re-commencing with a higher viscosity drilling fluid mix.
 - c. If the risk of further frac-out is high, a new drilling alignment shall be sought.

Construction Wastewater Disposal

1. Self-contained port-a-loos with integrated waste holding tanks shall be placed at the construction compound(s). These shall be maintained by the providing contractor and removed on completion of construction.
2. Water supply for the site office and other sanitation shall be brought to site and removed after use by a licensed contractor, to be discharged at a suitable off-site treatment location.
3. No additional water or wastewater shall be sourced on the site, nor discharged to the site.

9.2.1.4 Artificial Lighting

Construction works during hours of darkness will be kept to a minimum. Works shall be limited to normal working hours (08:00 to 18:00), with the site being secured and lighting being switched off outside of these hours, subject to safety and security requirements (this does not apply to areas within the existing WwTP which are subject to existing operational lighting).

Any works lighting shall be directed away from the River Barrow and all trees and vegetation to be retained, following the principles set out below in relation to the permanent lighting design.

All in-stream works and works near the riverbank shall be restricted to daylight hours. Therefore, there shall be no artificial lighting of the river channel or riverbanks.

The proposed operational lighting is restricted to the access roads within the WwTP site itself. No lighting is proposed west of Kilkenny Road. A lighting plan has been prepared for the WwTP site, which follows the below principles:

- Lighting design will fully take into account the presence of protected species. Appropriate lighting will be used, with more sensitive lighting regimes (in terms of both the type, extent and timing of light) deployed in wildlife-sensitive areas.
- Dark zones will be used to separate habitats or features such as waterbodies, hedgerows, treelines and scrub from lighting by forming a dark perimeter around them.
- Buffers will be used to protect dark zones and rely on ensuring light levels within a certain distance of a feature do not exceed defined limits.

The following, which is taken from Institute of Lighting Professionals *Guidance Note GN08/23*²⁹, shall be considered if choosing new luminaires: -

- All luminaires shall lack UV elements when manufactured. Metal halide, compact fluorescent sources shall not be used.

²⁹ ILP (2023). *Guidance Note GN08/23 - Bats and Artificial Lighting at Night*. Institute of Lighting Professionals.



- LED luminaires shall be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white light source (2700 Kelvin or lower) shall be adopted to reduce blue light component.
- Luminaires shall feature peak wavelengths higher than 550nm.
- Column heights shall be carefully considered to minimise light spill and glare visibility. This shall be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to issues such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they shall only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.
- Only luminaires with an upward light ratio of 0% and with good optical control shall be used.
- Luminaires must always be mounted on horizontally with no light output above 90° and/or no upward tilt.
- As a last resort, accessories such as baffles, hoods or louvres may be used to reduce light spill and direct it only to where it is needed.

9.2.1.5 Installation of Temporary Cofferdam

As these are in-stream works, they are limited to the period beginning on 1st July and ending on 30th September. Were it to be impossible to schedule these works to take place entirely within this period, Carlow County Council (on behalf of Uisce Éireann) would need to apply for a derogation under the Local Authorities (Works) Act, 1949 (as amended) from the Inland Fisheries Section of the Department of Climate, Energy and the Environment. However, as construction of the new outfall will take approximately 3 weeks to complete (including installation and removal of the cofferdam), timing these works to take place between 1st July and ending on 30th September is very feasible.

Following the precautionary principle, the assessment of the impact of piling noise in Section 8.2.8 above and in Wave Dynamics (2026) (see Appendix I to this NIS) was based on the worst-case scenario in terms of the piling method to be employed, i.e. percussive pile driving using an hydraulic hammer. This method of piling generates intense pulses of sound energy and, thus, is considered to be the most environmentally damaging method. Alternative methods such as hydraulic pushing/pressing or vibratory piling produce much lower peak outputs of sound and so are less damaging to the auditory organs of animals and less likely to induce behavioural responses (i.e. cause less disturbance). Other relatively quiet piling methods such as rotary driving are not applicable to sheet piles. On that basis, the following shall apply to piling for the temporary cofferdam:

- Wherever possible, piles shall be driven by hydraulic pressing.
- Where this is not feasible, vibratory piling will be deemed acceptable.
- Any percussive piling shall be limited to a small number (between 1 no. and 10 no.) strikes with an impact hammer to drive piles to refusal, where necessary.

These measures will further reduce the effects of piling noise on sensitive ecological receptors.

During dewatering, the pump intake shall be fitted with a screen or mesh to prevent intake of any fish or other aquatic life. Any fish (and crayfish, if present) within the isolated area shall be rescued (prior to dewatering) and released into



the river outside the cofferdam. The dewatering from the cofferdam will be to a settlement pond to be installed at a minimum of 20m from the river bank.

9.2.1.6 Additional Measures for Otter

All open excavations shall be securely fenced off and include ramps/ladders outside of active working hours to prevent Otters or other species from becoming trapped within them.

All in-stream works and works near the riverbank shall be restricted to daylight hours. Therefore, there shall be no artificial lighting of Otter habitats.

No Otter holts or couches were identified in the immediate vicinity of the proposed works. Thus, based on the current baseline, there is no requirement for a Regulation 54 derogation licence. However, given the confirmed presence of otters in the vicinity and the significant time likely to elapse between the surveys and the commencement of works, the possibility that Otters may establish new holts or couches in the vicinity cannot be entirely excluded. Therefore, pre-construction surveys to identify any new Otter holts or couches (should they occur) shall be undertaken in advance of works (including any investigatory or preparatory works).

These surveys shall be undertaken by a suitably qualified and experienced ecologist (appointed by the Contractor) as near as practicable (time-wise) to commencement of works, but no more than 12 months before commencement in any case. Should more than 12 months elapse between a pre-construction survey and commencement of works, a new survey will be required.

The results of these pre-construction surveys will determine the need or otherwise for any derogation licence (due to any changes in Otter use in the area in the intervening time between the planning application and start of works). The terms and conditions of any licence granted shall be strictly observed. The Contractor shall be responsible for applying for and executing any licences required, and shall be assisted by their own suitably qualified and experienced ecologist.

9.2.1.7 Additional Measures for Riparian Trees

The following shall apply to works in the vicinity of the 2no. willow trees at the riverbank either side of the proposed outfall headwall (T59 and T60) to ensure their retention:

1. These works shall be overseen by the Project Arborist and Contractor's ecologist, who shall provide guidance and advice, where appropriate.
2. These trees shall be protected from direct physical injury to the stems by sturdy barriers (such as plywood sheets on a timber framework) and the work taken with care to minimise any damage to the branching.
3. Where necessary, branching shall be pruned by professional tree surgeons to improve clearance and avoid branch breakage from machinery.
4. The extent of the open trench and other soil movements/disturbances in the vicinity of the trees shall be kept to a minimum and restricted to as far from the bases of the trees as is practicable.
5. Roots exposed by trenching shall be cut back to the trench face to leave a clean cut.
6. The trench shall be backfilled promptly after the pipe has been installed and ground levels around the trees shall be left unaltered.



9.2.1.8 Biosecurity

General

To prevent the import of invasive non-native species to the proposed development site, all vehicles, plant, equipment, and PPE shall be thoroughly checked for any signs of invasive species or their propagules, e.g. seeds or fragments of rhizomes, before being allowed on site, paying particular attention to wheels and tracks.

If there is any doubt as to the absence of invasive species materials, the vehicle/plant/equipment/PPE concerned shall be taken to one of the dedicated wash-down disinfection facilities described below and thoroughly cleaned and re-checked before being allowed on site.

The Biosecurity Standard Operating Procedure (SOP) set out in Section 3.1 of INVAS (2026), which is presented in Appendix D.2 to this NIS, shall be implemented for all works, including surveys, site investigations or any other activities on site.

Terrestrial Environment

During construction, works between the Kilkenny Road and the riverbank to construct the new outfall are assumed to interact with Japanese Knotweed and Himalayan Balsam. Therefore, the following shall be implemented:

- The Contractor shall set up dedicated wash-down/disinfection facilities for use on entry to/exit from the two works areas west of the Kilkenny Road, i.e. the outfall area and the area south of the existing pumping station.
- All personnel, visitors, materials and equipment shall be thoroughly cleaned in this facility and be checked to ensure that they are free of any signs of invasive species or their propagules, e.g. seeds or fragments of rhizomes, before being allowed to leave the area.
- Washings built up in the wash-down/disinfection facility shall be periodically removed and stockpiled for removal as detailed in the first bullet point.
- All personnel and visitors shall be made aware of the presence of invasive species, the importance of preventing their spread, and the measures/protocol being implemented by the Contractor to that end.
- Appropriate signage shall be erected at entry and exit points from this area to alert all personnel and visitors to the presence of this species.
- All arisings from excavations in this area shall be treated as contaminated with invasive species material and shall be stockpiled accordingly, in a bunded area at least 20m from the riverbank, and then removed to an appropriately licensed waste facility.

Works west of the Kilkenny Road in the vicinity of the existing WwPS shall be assumed to interact with Himalayan Balsam. The same arrangement as described above in relation to the outfall area is required here.

The proposed location for the southernmost intermediate tunnel shaft and its associated temporary works area have been moved away from the Three-cornered Leek on the eastern side the Kilkenny Road to a new location further south along the western side of the road. While there are no legally restricted species in this area, the 'Medium-impact' Traveller's-joy is present, smothering the adjoining hedgerow and trees. Although this species is not legally restricted, its spread to new areas would constitute a negative impact on Biodiversity. Therefore, should works encroach into the infested area, any arisings shall be removed off-site to an appropriately licensed waste facility and any vehicles, plant, equipment or PPE in contact with the same shall be thoroughly cleaned and checked before being permitted to leave the area.



Any Ash (*Fraxinus excelsior*) trees or material encountered during necessary tree felling and vegetation clearance shall be assumed to be infected with *Hymenoscyphus fraxineus*, the causal agent of 'Ash dieback disease'. Any Ash material arising from necessary tree felling or vegetation clearance works shall be dealt with in line with published best practice, e.g. Scottish Environmental Protection Agency (SEPA) advice on *Disposal of trees and plants infected with specific plant diseases*.³⁰

Aquatic Environment

During construction, all in-stream works shall be assumed to interact with Nuttall's Waterweed and aphanomycosis ("crayfish plague"). The following shall be implemented to control the risk of spread:

- The Contractor shall set up a wash-down/disinfection facility for use on entry to/exit from the outfall works area, i.e. the works area west of the Kilkenny Road (see indicative location in Figure 8-3 above). Contaminated water from the biosecurity station will be tankered off site to a licenced waste facility.
- All personnel, visitors, materials and equipment which have been in contact with the riverbed material shall be thoroughly cleaned in this facility and be checked to ensure that they are free of invasive species material before being allowed to leave the area.
- Washings built up in the wash-down/disinfection facility shall be periodically removed and stockpiled for removal as detailed in the first bullet point.
- All personnel and visitors to site shall be made aware of the presence of aquatic invasive non-native species and diseases in the in-stream works area, the importance of preventing their spread, and the measures/protocol being implemented by the Contractor to that end.
- Appropriate signage shall be erected on approach to the in-stream works area to alert all personnel and visitors to the presence of this species.³¹
- The Check-Clean-Dry/Disinfect protocol shown in Figure 9-1 below will apply to any vehicles, plant, equipment or PPE in contact with the water, including sheet piles/cofferdam units.
- All arisings from the in-stream works area shall be treated as contaminated with Nuttall's Waterweed and crayfish plague and shall be stockpiled accordingly in a bunded area at least 20m from the riverbank. This material shall then be removed off-site to an appropriately licensed waste facility.
- On their removal from the river following completion of the outfall works, the sheet piles shall be treated as per other materials or equipment used for in-stream works before leaving site.

To control the risk of the introduction or spread of aquatic invasive non-native species or diseases associated with the use of a barge for the temporary cofferdam works, the owner or operator of the barge shall submit the following to the Employer or Employer's Representative:

- Documentary evidence in the form of a completed and signed Marine Institute 'Cleaning and Disinfection Declaration Form' (Form No. C-038) or appropriate alternative, e.g. from Waterways Ireland, that the barge was fully cleaned and disinfected within 6 months immediately preceding its arrival on site; and,

³⁰ https://www.sepa.org.uk/media/154389/wst-g-037-disposal_of_trees_plants_with_specific_diseases.pdf

³¹ Templates for invasive non-native species and biosecurity signage are available on *Invasives.ie* (<https://invasives.ie/resources/check-clean-dry-resources/>).



- Records of the barge's movements during the 6 months immediately preceding its arrival on site.

If the above cannot be provided, the barge shall be fully cleaned and disinfected, e.g. at the Waterways Ireland dry dock at Athy, c. 20km north of the works area via the Barrow Navigation, or at another suitable location. This shall be done, under the supervision of the Contractor's ecologist, who shall make a record of the cleaning and disinfection of the barge and include this in their monitoring file.

The barge shall only be permitted to move to site once the Contractor's ecologist is satisfied that it does not pose a significant risk of importing aquatic invasive non-native species or diseases to the works area.



ATTENTION WATER USERS - Help stop the Invasion!

Invasive aquatic plants and animals harm our wildlife and block waterways.
Protect and enjoy your natural environment by remembering to:

CHECK

Check your equipment, boat, and clothing after leaving the water for mud, aquatic animals, or plant material. Remove anything you find and leave it at the site.

CLEAN

Clean everything thoroughly as soon as you can paying attention to areas that are damp and hard to inspect. Use hot water (at least 45°C) or a high-pressure spray.

DRY

Dry everything until it is dry for at least 48 hours before using elsewhere as some invasive plants and animals can survive for weeks in damp conditions.

Disinfect everything if complete drying is not possible.

**STOP
THE
SPREAD**

invasives.ie/biosecurity/check-clean-dry



An Roinn Tithíochta,
Rialtais Aintúil agus Oidhreachta
Department of Housing,
Local Government and Heritage



Figure 9-1 - Check-Clean-Dry/Disinfect Protocol. Source: *Invasives.ie*.



9.2.2 Post-construction Phase

Invasive Non-native Species

For a minimum of 4 years following completion of construction, Uisce Éireann shall continue to monitor invasive non-native species and implement the biosecurity measures described in this NIS, including the Biosecurity SOP set out in Section 3.1 of INVAS (2026), and will manage the Himalayan Balsam infestation in the vicinity of the outfall, following the *Irish Water Guidance on the Management of Himalayan Balsam* (IW-AMT-GL-002). Any regrowth of treated infestations shall be accurately mapped and reported to Uisce Éireann. The removal of invasive non-native species may be considered successful after four consecutive growing seasons with no signs of regrowth.

9.2.3 Operational Phase

Water Quality

Mitigation has been provided by design (by setting ELVs and designing the WwTP to comply with these, as described in Sections 2 and 6.5.2). As such, no further mitigation is required, other than maintenance of the operation of the WwTP. The upgraded WwTP will operate under Discharge Licence conditions, which will include:

1. Complying with the ELVs and ensuring that no discharge from the wastewater works exceed these ELVs.
2. Ongoing maintenance of all plant and equipment to ensure that no unauthorised wastewater discharge takes place.
3. Continued sampling and analysis of key water quality parameters in the discharge effluent and in the ambient environment, i.e. River Barrow upstream and downstream of the discharge point.
4. Continued monitoring of the influent stream in order to measure mass loadings to the WwTP.
5. Ongoing maintenance and calibration of all instrumentation.
6. Maintenance corrective action procedures and undertaking corrective action to address any non-compliances.
7. Notifying the EPA as soon as practicable if an incident occurs and, if the incident relates to discharge to water, notifying IFI as well.
8. Recording of all complaints of an environmental nature.

No additional mitigation measures beyond those set out in the Discharge Licence are necessary.

Invasive Non-native Species

Operational-phase monitoring will also follow Uisce Éireann's guidelines for Himalayan Balsam ((IW-AMT-GL-002), Japanese Knotweed (UÉ-AMT-SOP-009) and biosecurity during aquatic sampling (UÉ-AMT-GL-007).



9.3 Assessment of Residual Effects

Given the full and proper implementation of the mitigation prescribed in this section, the probability, likely magnitude and likely maximum extent of any water quality impacts associated with the proposed development do not present any risk of significant negative impacts on water quality in the River Barrow and, as such, will not result in adverse effects on the integrity of the River Barrow and River Nore SAC. Similarly, the effects associated with noise and visual disturbance to aquatic and woodland habitats and fauna, including from piling for the temporary cofferdam, and spread of invasive alien species and disease, are under effective control and will not result in adverse effects on the integrity of the River Barrow and River Nore SAC.



10. Potential In-combination Effects

10.1 Requirement for Assessment

The requirement for AA arising out of Article 6(3) of the Habitats Directive covers plans and projects that, “*either individually or in combination with other plans or projects*”, are likely to have a significant effect on one or more Natura 2000 sites. This means that AA is required for any plan or project that, in combination with other plans or projects, would have a significant effect on one or more Natura 2000 sites, irrespective of the presence or absence of such effects from that plan or project on its own. Therefore, regardless of the significance of the effects of the plan or project individually, the potential for significant effects in combination with other plans and projects must be considered in all cases.

10.2 Approach and Methodology

The objective of this requirement is to capture significant effects potentially arising from the cumulation or other interaction of non-significant effects from multiple plans and projects. Consequently, the assessment of potential in-combination effects is not a pair-wise assessment, rather, it considers the totality of the effects arising from all plans and projects affecting the Natura 2000 site(s) in question. In identifying the plans and projects to be included in this assessment, it is important to define an appropriate geographical scope and timescale over which potential in-combination effects are to be considered and the sources of information to be consulted, as described below. It is also important to consider the nature of the interactions between effects, which may be additive, antagonistic, synergistic or complex.

For practical reasons, the effects from the proposed development which are considered in the assessment of potential in-combination effects are the residual effects, rather than the effects in the absence of any mitigation. For this reason, this assessment is based on the proposed development following incorporation of the mitigation prescribed in the preceding section.

10.2.1 Geographical Scope

In defining the geographical scope for identifying potential in-combination effects, it is important to remember that effects are evaluated in view of the conservation objectives of the Natura 2000 site(s) concerned. As such, two or more effects relating to the same conservation objective for a given Natura 2000 site would combine even if their geographical extents did not overlap. For example, the loss of a small area of an Annex I habitat type listed as a qualifying interest of a Natura 2000 site would combine with the loss of an entirely unconnected area of the same habitat type from a remote part of the same site to produce an in-combination effect, the significance of which would need to be evaluated in view of the relevant conservation objective. On that basis, the scope of the assessment of in-combination effects extends to all plans and projects affecting the same conservation objectives as the plan or project under consideration, irrespective of whether those effects are significant or not.

However, given the scale of the proposed development and localised extents of its residual impacts, it was deemed sufficient to include only areas in close proximity to the proposed development and its zones of impact in the geographical scope for identifying potential in-combination effects.

10.2.2 Timescale

Given that the proposed development has an intended lifespan of c. 25 years (before further upgrades), the timescale for identification of other plans and projects with potential for in-combination effects cover plans and projects approved



in the last 5 years (i.e. since 1st January 2021), plans and project currently under consideration (principally those which have been applied for) and any other reasonably foreseeable future plans and projects.

10.2.3 Sources of Information

The following sources of information were consulted to gather information on other plans and projects: -

- *Carlow County Development Plan 2022-2028*. Carlow County Council, Carlow.
- Carlow County Council and Laois County Council planning application databases [accessed 19/05/2026].
- *EIA Portal* (<https://www.gov.ie/en/publication/9f9e7-eia-portal/>) [accessed 19/01/2026].
- *An Bord Pleanála Map Search* (<https://www.pleanala.ie/en-ie/map-search>) [accessed 19/01/2026].
- *EPA Maps (Water)* (<https://gis.epa.ie/EPAMaps/Water>) [accessed 19/01/2026].

The threats, pressures and activities with negative impacts on the Natura 2000 sites selected for inclusion in this assessment (see Section 7.2.1.3 of this NIS) were used to identify plans and projects which, by their nature, are likely to give rise to potential impacts on the sites concerned.

10.3 Assessment

10.3.1 Plans

Key plans which are of relevance to the proposed development are:

- Carlow County Development Plan 2022-2028
- Carlow-Graigieucullen Joint Urban Local Area Plan 2024-2030

These plans detail Carlow County Council and Laois County Council's strategy for proper planning and the sustainable development of Carlow town up to 2030. They include specific policies and objectives to respond to the expected population growth and other development in the town and protect Natura 2000 sites. The proposed development is key to ensuring that the wastewater services in the town have sufficient capacity to accommodate the growing population. As such, the proposed development will contribute positively to the protection of the aquatic environment, including Natura 2000 sites, in line with these plans.

10.3.2 Projects

The Carlow Southern Relief Road is a potential future road project located along the northern boundary of the WwTP site. While this project is still at the route options stage, the proposals are likely to include a river crossing that would require an elevated roundabout to the northwest of the WwTP site. The design may affect the final positioning and/or structural design of the new WwPS. The estimated programme is to complete route selection by Q4 of 2026 and submit a planning application in Q1 of 2028. Given that lack of information available about this project at present and the fact that it is significantly behind the WwTP in terms of the design, assessment and consenting processes, it is not possible to make an assessment of the potential for adverse effects on the River Barrow and River Nore SAC or any other European site at this time, and the in-combination effects section of the AA Screening Report or NIS for that project will have to include the proposed Mortarstown WwTP Upgrade.



Other projects within and in the vicinity of the three Natura 2000 sites concerned, as identified through the planning search for Carlow County Council and Laois County Council, the *EIA Portal* and *An Coimisiún Pleanála Map Search*, were as follows:

Table 10-1 - Cumulative Impact Assessment for Biodiversity.

Case No.	Decision	Description	Assessment
2460398	19/11/2025	48no. residential units (43no.3-bed dwellings, 2no. 4-bed, 3no. 2-bed), a Childcare Facility (of 319m ²) and all associated car parking, play areas, landscaping, and all associated site works to include a construction access from the partially complete Carlow Inner Relief Road direct to the proposed site. The subject site has a gross area of 2.739ha and is located at Mortarstown, Carlow, Co. Carlow with proposed access from the partially completed Carlow Inner Relief Road and through the practically complete Cluain Buí residential development.	The application is for works located c. 200m east of the proposed development, whereas the River Barrow and River Nore SAC is to the west. Given the nature and scale of this application and that it is located east of the proposed development with existing residential properties located between the two sites, there will be no adverse effects in combination with the proposed development.
2360019	24/07/2023	Alteration to previous permission Ref No: PL20/98. Installation of 2 no. wastewater treatment systems and percolation areas and associated site works on site.	The application is for works located c. 10m south of the proposed development. The works proposed are minor relating to installation of two wastewater treatment systems. They are located to the front of the properties as far from the river as possible. The addition of further treatment will be beneficial to water quality in the area. Due to the nature, scale, and timing, there will be no adverse effects in combination with the proposed development.
2460125	05/02/2025	A protected structure (RPS Ref. No. CW66). Works comprise: Demolition of two-storey extension to rear and single-story extension to side. Construction of new two-storey extension to rear and two-storey (basement and ground) extension to side. Reroofing to original detail, refurbishment of original windows and replacement of some non-original windows. Reinstatement of two blocked up windows to the rear. Alterations to internal layout. New mechanical and electrical services. Removal of septic tank	The application is for works located at Erindale, Mortarstown Upper, R93 E5Y0, c. 132m from the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
		and connections to mains. No parking or significant trees affected.	
21294	16/12/2021	Development consisting of an air dome (1,428.7m ²) for multi-use sports activities, primarily used for 2 no. indoor tennis courts. Works to include carpark and all associated site works. The existing facility is currently fully serviced by the existing services permitted and constructed under PL Ref. 15/324 and Ref. 18/178.	The application is for works located c. 173m of the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.
2460026	13/02/2025	Development will consist of essential maintenance and repair works to the Barrow Navigation, in accordance with Waterways Ireland's statutory remit, comprising the following: (i) Bank Revetment & Strengthening Works, (ii) Post-Flood Spot Dredging & Maintenance Dredging, (iii) Back-drain Maintenance, (iv) Small-scale Bank Repair Works, (v) Trackway Surface Upgrade Works, (vi) 10 no. Temporary Construction Compounds, (vii) Temporary mobile welfare units, and, (viii) All works ancillary and incidental to the maintenance and repair works referred to above. An NIS has been prepared in respect of the works and submitted with the planning application.	The application is for works located at a number of location along the River Barrow, the closest works location to the proposed development is c. 2km downstream. There is a potential for cumulative impacts with in-stream activities for the outfall construction. However, given the scale and duration of the works along with the proposed mitigation measures, any residual non-significant impacts will reach imperceptible levels due to dilution (suspended sediment and noise/vibrations) before reaching the nearest works. Therefore, there will be no adverse effects in combination with the proposed development.
2560137	Approved 03/12/2025	Solar farm with a total area of c. 57ha. The solar farm will consist of solar panels on ground mounted frames, 8 no. single-storey electrical inverter/transformer stations, 2 no. single-storey spare parts containers, 1 no. Ring Main Unit, 3 no. weather stations, underground electrical ducting and cabling within the development site, private lands and within the L4038, L8185, R448, L3051, L3052 and L3050 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 5 no. watercourse/drain deck crossings and 2 no. horizontal directional drill crossings (under M9 motorway and the Dublin - Waterford railway), temporary construction compounds, landscaping and all associated ancillary development	The application is for works located c. 1.4km southeast of the proposed development. The redline boundary for the solar farm abuts the River barrow (4.3km downstream of the proposed development) for approximately 100m. However, the solar farm within the redline boundary has been located at a minimum of 100m from the river bank. Given the scale and duration of the proposed development (proposed outfall) with the proposed mitigation measures any residual non-significant impacts will reach imperceptible levels due to dilution (suspended sediment and



Case No.	Decision	Description	Assessment
		and drainage works. Construction and operational access will be via 2 no. existing entrances from the R448 and L1010. Sections of the proposed underground electrical cabling will traverse the solar farms proposed under Carlow County Council References 24/60043 and 24/60205, but will not alter infrastructure proposed under these applications. The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration. An NIS has been prepared and submitted with the application.	noise/vibrations) before reaching the solar farm 4.3km downstream. Therefore, there will be no adverse effects in combination with the proposed development.
2360263	09/07/2024	Change of use from quarry to recovery activities, over a total area of 4.84ha, comprising: -The infilling of lands as a soil recovery facility with inert waste consisting of suitable uncontaminated soil & stone and dredging spoil, to improve land for agricultural use (4.792ha, total net import of 199,500 tonnes over 8 years); -An Administration Area (i0.048ha), to include a site hut/site office and portable chemical toilet; and -All associated site works and services required to facilitate the development.	The application is for works located c. 5.9km south of the proposed development. However, due to the nature of the works and distance from the proposed development both straight line and downstream, there will be no adverse effects in combination with the proposed development.
20180	13/07/2021	Installation of c. 4.6km of underground cables within the Carlow County Council (CCC) boundary and c. 2.0km within the Laois County Council (LCC) boundary with a voltage of up to 38kV and associated works, including a new substation within LCC, for the connection of the consented Bilboa Wind Farm (Planning Register References: Carlow County Council 11/154; An Bord Pleanála PL 01.240245) to the national electricity grid; upgrading of an existing forestry track within CCC; construction of two new onsite access tracks within CCC; re-orientation and increasing in size of a crane hardstanding within CCC; and road strengthening and widening along an updated turbine delivery route, within LCC, pursuant to the consented Bilboa Wind Farm (Planning Register References; Carlow County Council 11/154; An Bord Pleanála PL 01.240245).	The application is for works located c. 3.7km southwest of the proposed development. However due to the nature, scale and location, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
2460332	12/12/2024	The demolition of all existing structures within the Tinryland Wastewater Treatment Plant and the construction on an extended site (0.09ha in total) which will consist of a new pumping station (17m ²), new below-ground storm tank (total storage of 123m ³), replacement welfare facility (33m ²), ground-mounted photovoltaic array (83m ²), new palisade perimeter fencing (2.4m high) and associated works; the construction of a new rising main and gravity main (3.7km in length) along the Nurney Road, L1023 and N80, connecting to the existing wastewater sewer at Ballinacarrig; and all ancillary and associated temporary works.	The application is for works located c. 2.7km east of the proposed development. However due to the nature, scale and distance from both the proposed development and the River Barrow, there will be no adverse effects in combination with the proposed development.
22163	16/02/2023	Solar farm and associated works, comprising (1) A solar farm which will connect to the national electricity grid on lands with a total area of c. 128ha, consisting of solar panels on ground mounted frames, 18 no. single storey electrical inverter/transformer stations, equipment container, underground cabling within the solar farm site and within the N80 and L-3046 public roads to connect solar farm field parcels, security fencing, satellite communications pole, CCTV, access tracks inclusive of 9 no. agricultural bridges (including 1 no. bridge over the river Burren), temporary construction compounds, landscaping and all associated ancillary development works. (2) minor amendments to a neighbouring solar farm planning permission (Carlow County Council planning reference 20143 & An Bord Pleanála reference: 307891-20) to facilitate future grid connection and additional access tracks for the proposed development. These amendments will comprise of the removal of 1,837m ² of solar panels, provision of additional access tracks and focused removal of hedgerows to accommodate same, and the laying of 1,788m of 33kV underground cabling for the purposes of the future grid connection. (3) Construction and operational access for the solar farm will be via entrances from the L-7111, L-3046	The application is for works located c. 8.5km southeast of the proposed development. However due to the nature, scale and remoteness from the proposed development, , there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
		and L-3049. The operational lifespan of the solar farm will be 35 years.	
22110	07/08/2022	Sterile Manufacturing Facility at the site of existing biologics formulation and filling facility. The development comprises a total gross floor area of c. 7,787m ² , including; (i) a new two-storey production building (c. 7,641m ² and maximum height 18m) incorporating production suites, utilities, warehouse, workshops, laboratories, offices and plant rooms; (ii) a single storey MV electrical building (c. 146m ² and maximum height 4.5m); (iii) an external utilities yard comprising; covered wastewater management area, process waste tanks and sumps, process water storage tank, heat pumps, a new generator, an elevated pipe rack, and other miscellaneous pumps, plant and equipment; (iv) 85 no. new car parking spaces, and a new covered bicycle rack; (v) a temporary contractor's construction compound for the duration of the construction works; (vi) all associated permanent site development works, including; roads, paths, yards, underground services, and site landscaping. The extended utilisation of a temporary site access road from the existing roundabout on the R448 regional road; as permitted under Ref. 21/360 for the duration of works.	The application is for works located at Dublin Road, Pollerton Little and Oakpark, c. 4.4km northeast of the proposed development. However due to the nature, scale and remoteness from the proposed development, there will be no adverse effects in combination with the proposed development.
21360	18/11/2021	Site development works comprising site excavations and regrading, including removal of excess material, all within a site area of 9.8ha. In the east and north-east of the existing MSD facility at Dublin Road, Pollerton Little and Oakpark, Carlow. The works will include: (i) regrading of existing landscaped berms along the north eastern site boundary; (ii) creation of new landscaped berms on the eastern boundary of the site; (iii) installation of a temporary access road from existing roundabout on the R448 regional road to facilitate the site development works; (iv) all associated site development and landscaping works.	The application is for works located c. 4.6km northeast of the Proposed Development. However due to the nature, scale and remoteness from the proposed development, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
2460072	14/10/2024	Development at a 1.54ha site consisting of a 38kV/MV electrical substation, underground cables (UGC) & associated works. Development will include: 1) Construction of a substation compound of c. 2,850m² gross area, with 2.6m high palisade fence around entire perimeter of substation, with the following electrical plant within the substation: 1No. prefabricated 38kV GIS module & foundation (c. 31m², c. 5.2m high); 1 no. prefabricated MV GIS module & foundation (c. 32m², c. 4.7m high); 1 no. prefabricated Control Room module & foundation (c. 32m², c. 4.7m high); 2 no. 38/20kV 10 MVA transformers & assoc. bunds (c. 15m², c.4.5m high ea.); Telecommunication SCADA pole of c.10 metres in height; assoc. & ancillary outdoor electrical equipment & other apparatus, incl. installation of UGC; Internal access road of c. 40m in length & c. 5m wide within proposed substation; Compound lighting, boundary treatment, assoc. drainage, landscaping & all ancillary site development works; 2) Use of a portion of existing temporary road (c. 200m in length) permitted as part of recent MSD Rathgall development (Planning Ref: 21/360 & 22/110) for permanent use to facilitate access to proposed substation; 3) Construction of new stone wall, fencing & gates at existing junction of temporary road with public road; 4) Construction of internal access road (c. 140m in length) to proposed substation extending from existing temporary road on MSD lands to proposed substation; 5) Site clearance works related to proposed substation compound & access road incl. removal of existing shed, store building & flat at rear of former B&B (c. 376m², c.7.3m high), asphalt concrete yard adjacent to shed, septic tank, associated manholes & pipework, trees & hedgerow over a distance of c. 8m to facilitate construction of new internal access road, 6) Installation of c. 1.3km of double-circuit 38kV UGC along R448 road between proposed substation & existing Carlow–	The application is for works located c. 4.7km northeast of the proposed development. However due to the nature, scale and remoteness from the proposed development, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
		Graigue 38kV OHL; 7) Installation of c. 0.7km of single circuit 38kV UGC along R448 road between proposed substation & existing Carlow–Ballylinan 38kV OHL; 8) Installation of c. 0.3km of 6 circuit MV UGC along R448 road between proposed substation & existing R448 roundabout; 9) Installation of new 12m high steel lattice mast on existing Carlow–Graigue 38kV OHL; 10) Replacement of existing timber poleset (IMP1395) with new 15m high steel lattice mast on existing Carlow–Ballylinan 38kV OHL - located in Co. Kildare.	
2360101	12/01/2024	(1) Demolition of existing 2-storey industrial buildings, (2) the construction of 32no. dwelling units consisting of 2no. one-bed (single-storey) duplex apartments and 13no. two bed (single-storey) duplex apartments, 15no. three bed (2-storey) duplex apartments, 2no. three bed (semi-detached) townhouses, (3) car parking with new vehicular entrance (4), boundary treatments, (5) bicycle storage provision and storage outbuildings, (6) soft and hard landscaping, (7) ESB provision, (8) connection to existing site services and all ancillary site development works.	The application is for works located c. 1.41km north of the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.
21114	05/10/2021	Development at a site of c. 0.63ha , (existing store permitted under Ref. PD3679). The development will consist of (a) Demolition of the existing foodstore and substation on the site of c. 1,411m ² ; (b) Construction of a new part 1-, part 2-storey foodstore (to include off-licence) with gross floor area of c. 1,969m ² (net retail area 1,280m ² .); (c) Upgrade of the existing vehicular / pedestrian access from Hanover Road including relocation of the entrance 6m to the west; (d) Minor reconfiguration of the existing carpark and a reduction of 20 no. car parking spaces to provide a total of 100 no. car parking spaces and 10 no. bicycle spaces; (e) Replacement and relocation (c. 12m south) of the existing pole sign with a new internally illuminated, double-sided, free-standing, identification pole sign, 4 no. single-sided internally illuminated gable	The application is for works located c. 1.2km north of the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
		signs, 1 no. single-sided window sign at entrance door (f) c. 90m ² of solar panels at roof level; (g) All landscaping / lighting, boundary treatment, engineering and site development works (including ESB substation and switch room c. 21m ²).	
2460059	09/12/2024	Phase 2 of an overall residential development of 131 dwellings plus Creche. Phase 2 to consist of 24 dwellings to include: 2 No. Type A – three bedroom two storey semi-detached dwellings, 12 No. Type B – four bedroom two storey semi-detached dwellings, 6 No. Type C/C1 – four bedroom two storey semi-detached dwellings, 4 No. Type H – three bedroom two storey town houses, plus all landscaping and site enclosures plus all associated site works and services.	The application is for works located 0.4km west of the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.
2360289	18/09/2023	Completion of previously approved developments (P.A. Ref: 04/890 as varied by 07/939, including Extensions of Duration Permissions 09/597, 12/220 and 17/658) as they relate to House Nos. 51 to 80 (28 no. semi-detached two-storey three-bedroom and two no. semi-detached two-storey four-bedroom houses) and the provision of landscaping, including boundary treatments; and the provision of all other associated site excavation, infrastructural and site development works above and below ground.	The application is for works located 0.7km west southwest of the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.
2560210	31/07/2025	(a) The provision of 98no. two-storey semi-detached dwellings consisting of the following unit mix: 8no. 4-bed dwellings, 82no. 3-bed dwellings, and 8no. 2-bed dwellings, (b) Provision of new internal roadways and footpaths by extension of the existing residential access road from Meadows Way, with associated works to facilitate vehicular, pedestrian and cycle access and car parking; (c) Provision of a shared footpath and cycle lane connection with previously approved adjacent housing development (Planning Reference 23/3 and 24/60059); (d) Provision of open space areas to include all hard and soft landscape works,	The application is for works located c. 0.7km west of the proposed development. However due to the nature and scale, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
		planting and boundary treatments; (e) All other associated site excavation, infrastructural and site development works above and below ground including; surface water drainage system, foul sewerage network including connection to previously approved foul pumping station (Planning Reference 23/60019), public lighting and all ancillary site development works.	
2460049	25/03/2025	Essential maintenance and repair works to the Barrow Navigation, in accordance with Waterways Ireland's statutory remit, comprising the following: (i) Maintenance and repair works to the Barrow Navigation comprising post-flood spot dredging and maintenance dredging, (ii) A new temporary access road providing access to the Barrow trackway from Leighlin Road to facilitate the proposed works, (iii) Temporary mobile welfare units and , (iv) All works ancillary and incidental to the maintenance and repair works referred to above.	The application is for works located c. 0.3km west of the proposed development. The closest work are for the maintenance program is dredging of the Clogrennan Canal 300m downstream of the proposed new outfall. The proposed dredging works are located off the Main River Barrow Channel in the Canal. As the canal has a slow flow suspended solids will quickly fall out of suspension. Given this, and the short duration for the installation of the proposed new outfall, there will be no adverse effects in combination with the proposed development.
2460205	Approved 27/05/2025	10-year planning permission for a solar farm with a total area of c. 73 ha in the townlands of Ballybar Lower, Ballybar Upper, Ballycarney, Ballyloo, Linkardstown, Park and Tinryland in Co. Carlow. The solar farm will consist of solar panels on ground-mounted frames, 11 no. single-storey electrical inverter/transformer stations, 3 no. single-storey spare parts containers, 2 no. Ring Main Units, 3 no. weather stations, underground electrical ducting and cabling within the development site, private lands and within the L1010, L3051, L3052 and L3050 public roads to connect solar farm field parcels, security fencing, CCTV, access tracks, 3 no. watercourse/drain deck crossings and 2 no. horizontal directional drill crossings (under M9 motorway and L3050), temporary construction compounds, landscaping and all associated ancillary	The application is for works c. 1.6km southeast of the proposed development. Given the nature and location of this project, there will be no adverse effects in combination with the proposed development.



Case No.	Decision	Description	Assessment
		development and drainage works. Construction and operational access will be via 2 no. entrances from the L1022 and L1010. Sections of the proposed underground electrical cabling will traverse the solar farm proposed under Carlow County Council Reference 24/60043, but will not alter infrastructure proposed under that application. The operational lifespan of the solar farm will be 40 years and planning permission is requested for this duration.	
2560328	On Hold – Received 24/10/2025 (Further Information Requested)	Residential development of 52 dwellings consisting of; 3 no. block type A buildings, each consisting of 4 no. 2-bed own-door apartments and 4 no. 2-bed town houses, plus 3 no. block type B buildings, each consisting of 2 no. 2-bed own-door ground-floor apartments and 2 no. 3-bed duplex apartments, plus 2 no. block type C buildings, each consisting of 2 no. 2-bed own-door apartments and 2 no. 2-bed town houses, plus 2 no. block type D buildings, each consisting of 2 no. 2-bed own-door apartments and 2 no. 3-bed town houses, plus all associated parking, public open space provision, landscaping and boundary treatments, water and utility services and connections, lighting and all enabling works, site works and ancillary development works above and below ground plus new site entrance.	The application is for works located c. 127m west of the proposed gravity sewer (on the other side of the River Barrow). Given the nature and scale of this project, there will be no adverse effects in combination with the proposed development.
2560406	On Hold – Received 10/12/2015 (Further Information Requested)	(a) Demolition of 2-story section of the hotel on North Elevation, demolition of 2 no. stairwell North & South elevations and demolition of existing store and arch gateway to the South. (b) A Proposed 3-storey 42 room extension over plant room / store rooms (c) Proposed leisure centre, gym, spa, treatment rooms, changing rooms, café / reception area, function / meeting rooms all other associated developments. (d) Proposed roof garden / terrace areas, (e) Proposed bin store to the rear, (f) Proposed revised layout and extension of the car park to include, 192 no. standard car parking spaces, 14 no. Disabled spaces, 4 no. EV Charging Spaces, 48 no. Ducted EV Spaces, 3 no. Bus Set down areas, 258 Total spaces.	The application is for works located c. 700m southwest of the proposed development. Given the nature of this project and its location relative to the proposed development, there will be no adverse effect in combination with the proposed development.



Case No.	Decision	Description	Assessment
		(g) Proposed ESB substation, (h) Proposed signage to building elevation and free standing site/directional signage, (i) Internal amendments and all associated site works necessary to facilitate the proposed development.	
2460258	Approved 24/01/2025	South East Technological University (SETU) Carlow application for planning permission at the SETU Carlow Campus, Kilkenny Road, County Carlow, on a site measuring 0.552ha bounded by the Kilkenny Road to the west. The proposed development reflects the previously granted planning application on the subject site under Pl. Ref. 19/492. The site is to be accessed by an existing vehicular entrance to SETU Carlow Campus off the Kilkenny Road. The development will consist of the following: i. Construction of a part single-storey, part 4-storey Third Level Educational Health Sciences Building of 6,133m² gross internal floor area. The building will comprise science laboratories, clinics, sports and health science spaces including large gym labs and running track, and administration rooms with a central roof-lit social space on the upper floors and large entrance hall in the south east corner of the building. ii. Provision of plant and screening at roof level. iii. Provision of 176 no. bicycle parking spaces. iv. Provision of 105m² sheltered bicycle store on the eastern boundary of the campus. v. All associated site development works, site services, signage, provision of Sustainable Drainage Systems (SuDS), and landscaping works.	The application is for works located c. 292m north of the underground gravity sewer. Given the nature of this project and its location relative to the proposed development and sensitive ecological receptors, there will be no adverse effect in combination with the proposed development.



10.3.3 Known River Pressures and Licensed Activities

EPA Maps (Water) was reviewed to identify known pressures on the River Barrow in and downstream of Carlow town and any licensed activities in the locality.

Both within and downstream of Carlow, hydromorphology is identified as a significant pressure. Given the assessment of the hydrological effects of the proposed development in this NIS, it is clear that the proposed development will not worsen this existing pressure.

Within Carlow town, urban run-off is identified as a significant pressure. As explained in Section 6.5.2 above, the replacement of the existing Kilkenny Road WwPS with a new gravity sewer and larger WwPS and stormwater storage tanks at the WwTP site will reduce the frequency and volume of overflows (including urban surface water run-off) from the Kilkenny Road site. As such, the proposed development will assist in reducing this pressure.

Downstream of Carlow town, and throughout much of the Barrow catchment, agriculture is identified as a significant pressure. Given the nature of the proposed development and the limited extent of its residual effects, it will not give rise to adverse effects in combination with agricultural pressures. This same conclusion is also reached in Chapter 12 Water of the EIAR for the proposed development.

There are 2no. Integrated Pollution Prevention Control Licences (IPCs) in the vicinity of Carlow town.

Braun Oral-B Ireland Ltd held licence P0287; however, this licence was surrendered in 2013 and activities have ceased, as such there is no longer any activity with which the proposed development could have in-combination effects.

Irish Sugar Ltd (Carlow) holds licence P0222. The former Irish Sugar Factory in Carlow is a brownfield site formerly used for the industrial processing of sugar beet and sugar production. The production of sugar required the slicing and pulping of the beet, extraction of juices and purification of the liquid sugars using lime and carbon dioxide from calcinated limestone. The factory closed in 2005. The excavation and screening of lime continues on site. This is sold off site as a soil improver for the agricultural and mushroom casing industries. It is estimated that it will take 8-10 years to process the remaining lime material at the site. As part of the excavation of lime, an area of hydrocarbon contamination was identified in 2021. This area was excavated during 2022, the contaminated material was stockpiled pending remediation, and the excavation void was sampled and confirmed to be clean. New biopiles were constructed in 2024 to remediate the heavy fuel oil impacted stockpiles. Given the measures in place on site, there is no pathway for in-combination effects with the proposed development.

Chapter 12 Water of the EIAR for the proposed development also found that there would be no cumulative impact on surface waters or groundwater arising from the proposed development and other projects. Therefore, adverse effects in this regard can be ruled out.

10.3.4 Other Wastewater Treatment Plants

The proposed development has the potential to interact with the discharges from other Urban WwTPs upstream and downstream of the Mortarstown WwTP site. The Third Cycle Barrow Catchment Report (EPA, 2024) states that Urban WwTPs are a significant pressure in 15no. 'At-risk' surface waterbodies. None of these 'At-risk' surface waterbodies are located downstream of the Mortarstown site. Furthermore, 5 no. previously impacted waterbodies are no longer 'At risk' from urban wastewater pressures with the following agglomerations no longer being considered as significant pressure since Second Cycle of the WFD:

- Athy (D0003)
- Borris (D0248)



- Stradbally (D0292)
- Goresbridge (D0529)
- Muinebheag and Leighlinbridge (D0090)
- Old Leighlin (A0096)

Several of these agglomerations (Borris, Goresbridge, Muinebheag and Leighlinbridge) are located downstream of the Mortarstown WwTP. Therefore, the treatment of urban wastewater downstream of the proposed development is improving and there is an associated improvement in water quality in the River Barrow. The proposed upgrade works will likely contribute to these improvements. As such, there is a positive in-combination effect in this regard.

10.4 Conclusion

Based on the above assessment, due to the nature of the proposed development and given the implementation of the mitigation described in the previous section, it is concluded that there will be no adverse effects on the River Barrow and River Nore SAC or any other Natura 2000 site arising from the combination of the proposed development with other plans and projects.



11. Conclusion

This NIS has examined the details of the proposed upgrades to the Mortarstown WwTP and Kilkenny Road WwPS in Carlow Town and the Natura 2000 sites in their Zone of Influence. It has analysed the potential impacts of the proposed development on the receiving natural environment and evaluated its effects, in view of the conservation objectives of the relevant Natura 2000 sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Planning and Development Act, Habitats Regulations, relevant case law and guidance from the European Commission, the relevant Government Departments, and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

Given the full and proper implementation of the mitigation detailed in this NIS, it can be concluded beyond reasonable scientific doubt that the proposed development will not, either individually or in combination with other plans or projects, give rise to any impacts that would constitute adverse effects on the River Barrow and River Nore SAC or any other Natura 2000 site, in view of their conservation objectives. Therefore, it is recommended that the competent authority may determine that the proposed development, either individually or in combination with other plans or projects, will not adversely affect the integrity of any Natura 2000 site, provided that the mitigation prescribed in this NIS is fully and properly implemented.



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