ARUP

Roscommon County Council

Lough Funshinagh Interim Flood Relief Scheme

Environmental Impact Assessment Screening Report

Reference:

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1. Introduction

Ove Arup & Partners Ireland Ltd (Arup) has been appointed by Roscommon County Council (RCC) to prepare this Environmental Impact Assessment (EIA) Screening Report to determine whether EIA is required for a proposed interim flood relief scheme for Lough Funshinagh, County Roscommon, herein referred to as 'the proposed scheme'.

The proposed scheme comprises the construction of overground pipelines and associated pumps, plant, equipment and fencing, on a short-term interim basis, to mitigate the flood risk posed by Lough Funshinagh ('the lough'). The aim of the proposed scheme is to exact a sufficient volume of water from Lough Funshinagh that will negate or partly negate the increase in level and to limit the peak water level in the winter seasons of 2024-2025 and 2025-2026 to reduce the risk of flooding on nearby residences and the Curraghboy village. The proposed scheme will take water from Lough Funshinagh and discharge the water to the Cross River. It will be constructed in 2024 and will be fully decommissioned in 2026.

This report sets out the results of the EIA screening and provides the information necessary to undertake the EIA screening assessment in respect of the proposed scheme.

1.1 Background

Lough Funshinagh is defined as a turlough or 'disappearing lake' located approximately 13 km to the northeast of Athlone town in Co. Roscommon. In recent years, and in particular since 2016, water levels in the lough have risen, resulting in flooding of nearby property and increasing the flood risk to Curraghboy village which is 1.7 km to the southwest of the lough. Roscommon County Council is in the process of designing a more permanent scheme to manage flood risk in the vicinity of the lough. The proposed scheme is an interim scheme for up to two years only. Prior to the implementation of the permanent scheme, more immediate measures are needed to manage flood risk, particularly for local property and for the village of Curraghboy. To that end, an interim scheme has been designed, with the aim to extract enough water from Lough Funshinagh to prevent flooding in the surrounding areas. This will involve pumping water for up to 24 months when the lough level exceeds 67.50 metres above Ordnance Datum (mOD). Pumping rates will be adjusted based on the receiving river (Cross River) flow conditions and will not exceed 300 litres per second. A remote monitoring system will control the pumping process, allowing for changes in flow rate or shutdowns as needed. Monitoring river flow in the Cross River will also help to ensure effective management of the overall system.

The proposed scheme comprises two pumps working in parallel, pumping water from the lough, into an overland pipe which will run from Lough Funshinagh to the Cross River, approximately 2.7 km southwest of the lough. The overland pipe will discharge the pumped volume of water to the Cross River. The proposed scheme has been designed with due cognisance for the sensitivity of the lough, the River Cross and the pipe route.

A more detailed description of the proposed scheme is provided in Section 3.

2. EIA Screening Methodology

2.1 Guidance

The following guidance and consultation documents have been considered during the preparation of this report:

- Department of Housing, Planning, Community and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)
- Department of the Environment, Heritage and Local Government (2003) Environmental Effect Assessment (EIA) Guidance for Consent Authorities regarding Sub-threshold Development
- European Commission (2017) Environmental Impact Assessment of Projects - Guidance on EIA Screening
- European Commission (2015) Interpretation of definitions of project categories of annex I and II of the EIA Directive
- Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports, and
- Office of the Planning Regulator (June 2021) OPR Practice Note PN02 Environmental Impact Assessment Screening.

The characterisation of effects, in terms of quality, significance, extent, probability and duration, was based on the EC Guidance on EIA Screening (EC, 2017), which provides a checklist to help users decide whether EIA is required based on the characteristics of a project and its environment. This screening checklist was used in the screening assessment. Section 8 presents the EC checklist.

2.2 Legislation

The current requirements for EIA for projects are set out by the European Union in Council Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment, as amended by Directive 2014/52/EU.

The requirements of the 2014 EIA Directive were transposed into Irish law with the enactment of a number of implementing legislative measures, including S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018. These Regulations resulted in amendments to the following legislation which are considered relevant to this proposed scheme:

- Planning and Development Act, 2000 (No. 30 of 2000), as amended
- Planning and Development Regulations, 2001 (S.I. No. 600 of 2001), as amended
- European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010).

2.2.1 EIA Directive

The EIA Directive (Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU) defines the term ‘project’ as meaning:

“*the execution of construction works or of other installations or schemes, - other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources*.”

Article 4 of the Directive imposes the requirement for an EIA for the projects to which the Article applies. These projects are listed in Annexes I and II of the Directive. For Annex I projects, an EIA is mandatory. Member States must determine if an EIA is mandatory for Annex II projects. Member States must make the determination through (a) a case-by-case assessment or (b) thresholds or criteria set by the member State.

Articles 4(4) and 4(5) of the EIA Directive set out the requirements for EIA screening of Annex II projects. Annex IIA lists the information to be provided by the developer to the competent authority to enable it to screen projects. Annex III of the EIA Directive sets out the criteria to be examined when carrying out EIA screening.

The proposed scheme comprises the installation of an overground pipeline to remove water from Lough Funshinagh, and associated plant, equipment and fencing, on an interim basis, for the purposes of flood relief. Thus, the proposed works are considered to constitute a 'project' and the EIA Directive applies to the proposed works.

2.2.2 Planning and Development Act and Planning and Development Regulations

The EIA Directive has been transposed into Irish law under the Planning and Development Act, 2000, as amended and the associated Planning and Development Regulations 2001, as amended, including as amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

Section 172 of the Planning and Development Act 2000, as amended, sets out the requirement for EIA.

The prescribed classes of development and thresholds that trigger a mandatory Environmental Impact Assessment are transposed from Annex I and II of the Directive and set out in Schedule 5 of the Planning and Development Regulations 2001, as amended.

Under the legislation, all projects (defined in Section 2.2.1) can be placed into one of the following categories with regard to the EIA process:

- Those that exceed the thresholds set out in the legislation and therefore have a mandatory requirement to prepare an EIAR
- Those projects that are sub-threshold and must be assessed on a case-by-case basis to determine whether or not they are likely to have significant effects on the environment; and
- Projects that fall under Annex II (13) (a) of the EIA Directive where any change or extension of projects listed in Annex I or Annex II, already authorised, or in the process of being executed may require EIA.

The information to be provided by the applicant or developer for the purposes of screening sub-threshold development for EIA is set out in Schedules 7 and 7A of the Planning and Development Regulations 2001, as amended.

A review of the project types listed in Schedule 5 has been carried out.

2.2.2.1 Requirements for Mandatory EIA

A review of the project types listed in Schedule 5; Part 1 has been carried out.

Sch. 5, Pt. 1, § 11	Groundwater abstraction or artificial groundwater recharge schemes, where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.

This project type relates to the abstraction of groundwater. Under the Water Framework Directive (2000/60/EC), "groundwater" is defined (at Article 2(2)) as "*all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil*". The proposed scheme comprises the abstraction of water that is above the surface, not below. Therefore, the proposed scheme is not considered to be of this project class.

Sch. 5, Pt. 1, § 12(a)	Works for the transfer of water resources between river basins, where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres per year.
Sch. 5, Pt. 1, § 12(b)	In all other cases, works for the transfer of water resources between river basins, where the multi-annual average flow of the basin of abstraction exceeds 2,000 million cubic metres per year and where the amount of water transferred exceeds 5 per cent of this flow.

These project types relate to the transfer of water resources between river basins. The Water Framework Directive defines the term "river basin" (at Article 2(13)) as "*the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta*". This definition indicates that a river basin can consist of water features such as streams, rivers and lakes. Lough Funshinagh and the Cross River (the receiving water body) are located within the Water Framework Directive (WFD) catchment of 'Upper Shannon 26G' and the subcatchment of Shannon [Upper]_SC_100. Therefore, the proposed scheme comprises the transfer of water resources within the same river basin and not between river basins.

Therefore, the proposed scheme is not a project type/class listed in Part 1 of Schedule 5 of the Planning and Development Regulations 2001, as amended. Thus, a mandatory EIA is not required under Part 1.

2.2.2.2 Sub-threshold Development

The proposed scheme is considered with regards to the classes of development in Part 2 of Schedule 5.

Sch. 5, Pt. 2, § 10(l)	Groundwater abstraction and artificial groundwater recharge schemes not included in Part 1 of this Schedule where the average annual volume of water abstracted or recharged would exceed 2 million cubic metres.

This class of development relates to the abstraction of groundwater. Under the Water Framework Directive (2000/60/EC), "groundwater" is defined (at Article 2(2)) as "*all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil*". The proposed scheme comprises the abstraction of water that is above the surface, not below. Therefore, the proposed scheme is not considered to be of this project class.

Sch. 5, Pt. 2, § 10(m)	Works for the transfer of water resources between river basins not included in Part 1 of this Schedule where the annual volume of water abstracted or recharged would exceed 2 million cubic metres.

This project type relates to the transfer of water resources between river basins.

As noted above in Section 2.2.2.2, the Water Framework Directive defines the term "river basin" (at Article 2(13)) as "*the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta*". This definition indicates that a river basin can consist of water features such as streams, rivers and lakes. Lough Funshinagh and the Cross River (the receiving water body) are located within the Water Framework Directive (WFD) catchment of 'Upper Shannon 26G' and the subcatchment of Shannon [Upper]_SC_100. Therefore, the proposed scheme comprises the transfer of water resources within the same river basin and not between river basins.

Therefore, the proposed scheme is not considered to be of this project class.

Sch. 5, Pt. 2, § 1(c)	Development consisting of the carrying out of drainage and/or reclamation of wetlands where more than 2 hectares of wetlands would be affected.
Sch. 5, Pt. 2, § 10(f)(ii)	Canalisation and flood relief works, where the immediate contributing sub-catchment of the proposed works (i.e. the difference between the contributing catchments at the upper and lower extent of the works) would exceed 100 hectares or where more than 2 hectares of wetland would be affected or where the length of river channel on which works are proposed would be greater than 2 kilometres.

These two project types relate to projects impacting wetlands. The Ramsar Convention on Wetlands was adopted in 1971 and entered into force in Ireland on 15 March 1985. The definition of "wetlands" (at Article 1) is: "*areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres*".

The Planning Regulations define wetlands (at article 5(1)) to mean "*natural or artificial areas where biogeochemical functions depend notably on constant or periodic shallow inundation, or saturation, by standing or flowing fresh, brackish or saline water*".

In 2018, the Irish Ramsar Wetlands Committee published an "Identification Guide and Field Survey Manual for Irish Wetland Types"[1]. Section 2 describes a wetland to include "*an area of land that is saturated with water either permanently or seasonally, and where the water table is near or at the surface*". It elaborates that "*where they include saturated soil*", each of "*lakes*", "*ponds*" and "*turloughs*" should be considered wetlands.

It is clear from the above that the turlough at Lough Funshinagh could be considered a wetland. However, the turlough has in recent years, and in particular since 2016, risen in level such that adjoining agricultural land, roads and dwelling are inundated due to flooding. The proposed scheme intends to pump water from the lough, while the lough level exceeds 67.5 m OD, until a more permanent flood relief scheme can be put in place. This level is well above the historical 'natural' turlough level and therefore it is not considered that the scheme will result in draining of the wetland, where the wetland is considered the historical turlough are and therefore the proposed scheme is not considered to be a project of the type described in Sch.5, Pt.2, 1(c).

The proposed scheme is however, clearly a flood relief scheme, as defined in Sch. 5, Pt. 2, 10(f)(ii).

Given the nature of the proposed scheme and for the reasons stated above, the threshold for wetlands is not considered to be exceeded, nor is the threshold for length of river channel (2 km) exceeded. In terms of the threshold for contributing catchments, given the very localised nature of the works at Lough Funshinagh, and the existing established groundwater link between the lough and the Cross River within the same catchment, this threshold is not exceeded.

Notwithstanding, the project can be considered to be a sub-threshold project under this class (Part 2, 10(f)(ii)) for the purposes of EIA screening.

Sch. 5, Pt. 2, § 10(f)(i)	Inland waterway construction not included in Part 1 of this Schedule which would extend over a length exceeding 2 kilometres.

An 'inland waterway' is described in Paragraph 8(a) of Part 1 of Schedule 5 as "*inland waterways and ports for inland waterway traffic which permit the passage of vessels of over 1,350 tonnes*". This definition indicates that inland waterways refer to navigable waterways for water-based transport, and traffic that permits the passage of vessels. Therefore, this project type is not applicable to the proposed scheme which involves the transport of water via pipelines.

Sch. 5, Pt. 2, § 10(j)	Installation of overground aqueducts which would have a diameter of 1,000 millimetres or more and a length of 500 metres or more.

There is no definition of 'aqueduct' in either the Directive or the Regulations. The ordinary definition is '*a conduit or artificial channel for conducting water from a distance, usually by means of gravity'*.

In the European Commission's guidance on EIA screening, they note that only one Member State considers sewers and water supply networks to fall within the meaning of 'aqueduct'. The project will consist of two parallel 300 mm diameter flexible pipes each with a length of approximately 2,130 metres from the lough to a point 160m south of the L2013 road. This will be followed by a single 500 mm diameter PE ribbed pipe which will be approximately 320 metres in length to the outfall in the Cross River.

While the proposed scheme does not exceed the thresholds of Part 2, Class 10 (j) with regards to the diameter of the 'overground aqueducts', the proposed scheme could potentially be considered to be sub-threshold for this class of project.

2.2.2.3 Requirements for Sub-threshold EIA

The proposed scheme is not directly a project type/class listed in Part 2 of Schedule 5 of the Planning and Development Regulations 2001, as amended. However, Part 2(15) of the Regulations states that EIA may be required for:

[1] Irish Ramsar Wetlands Committee, 2018. Irish Wetland Types – an identification guide and field survey manual. EPA, Johnstown Castle, Ireland. ISBN: 978-1-84095-740-2

"Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7."

Part 2(15) of the Regulations ultimately requires the competent authority to determine, in the case where a project is considered 'sub-threshold' to the projects listed in Part 2 of Schedule 5, whether the project would likely give rise to significant effects on the environment.

Having regard to Part 2(15) of Schedule 5 of the Regulations, the proposed scheme could be considered sub-threshold development under the project types:

- 'Flood relief scheme', in respect of Part 2 10(f)(ii) of the Regulations; and
- Potentially as project type 'aqueduct' in respect of Part 2 10(j).

Thus, as the proposed scheme can be considered to constitute 'sub-threshold' development with regards to the Regulations, an assessment is required to be carried out to determine if the proposed scheme has the potential to give rise to significant effects on the environment.

2.3 Screening for EIA for Sub-Threshold Development

This report presents information on the proposed scheme's compliance with the requirements of Annex IIA (and Schedule 7A of the Planning and Development Regulations 2001 as amended), taking into account the criteria listed in Annex III of the EIA Directive (and Schedule 7 of the Planning and Development Regulations 2001 as amended) to assist the competent authority in the formal screening process. Refer to Table 1 for an overview of relevant information required for the EIA Screening for sub-threshold development.

Table 1 Information Required for the Purposes of Screening Sub-threshold Development for Environmental Impact Assessment

EIA Directive Annex IIA	Report Section
1. A description of the project, including in particular: a. a description of the physical characteristics of the whole project and, where relevant, of demolition works; b. a description of the location of the project, with particular regard to the environmental sensitivity of geographical areas likely to be affected.	Refer to Section 3
2. A description of the aspects of the environment likely to be significantly affected by the project	Refer to Section 7
3. A description of any likely significant effects, to the extent of the information available on such effects, of the project on the environment resulting from: a. the expected residues and emissions and the production of waste, where relevant; b. the use of natural resources, in particular soil, land, water and biodiversity.	Refer to Section 7
4. The criteria of Annex III shall be taken into account, where relevant, when compiling the information in accordance with points 1 to 3.	Refer to Section 7

The screening assessment and checklist in line with EC Guidance (EC 2017) to determine if the proposed scheme would be likely to have significant effects on the environment is presented in Section 8.

3. Description of the Proposed scheme

3.1 Location of the proposed scheme

The proposed scheme is located southwest of Lough Funshinagh. The route runs from the intake pump within the lough for approximately 2.7 km to the outfall location on the Cross River, as shown in Figure 1.

The land use surrounding the proposed route is agricultural lands and sporadic residential dwellings. The intake pump will be placed within the lough and connected to two diesel-powered hydraulic pump units (HPUs) located on purpose-built compound in an agricultural field near the edge of the lough. The overground pipeline will run through agricultural fields and transverse underneath three roads (R362, L2013 and a private access road adjacent to the R362 road) to the outfall point at the Cross River.

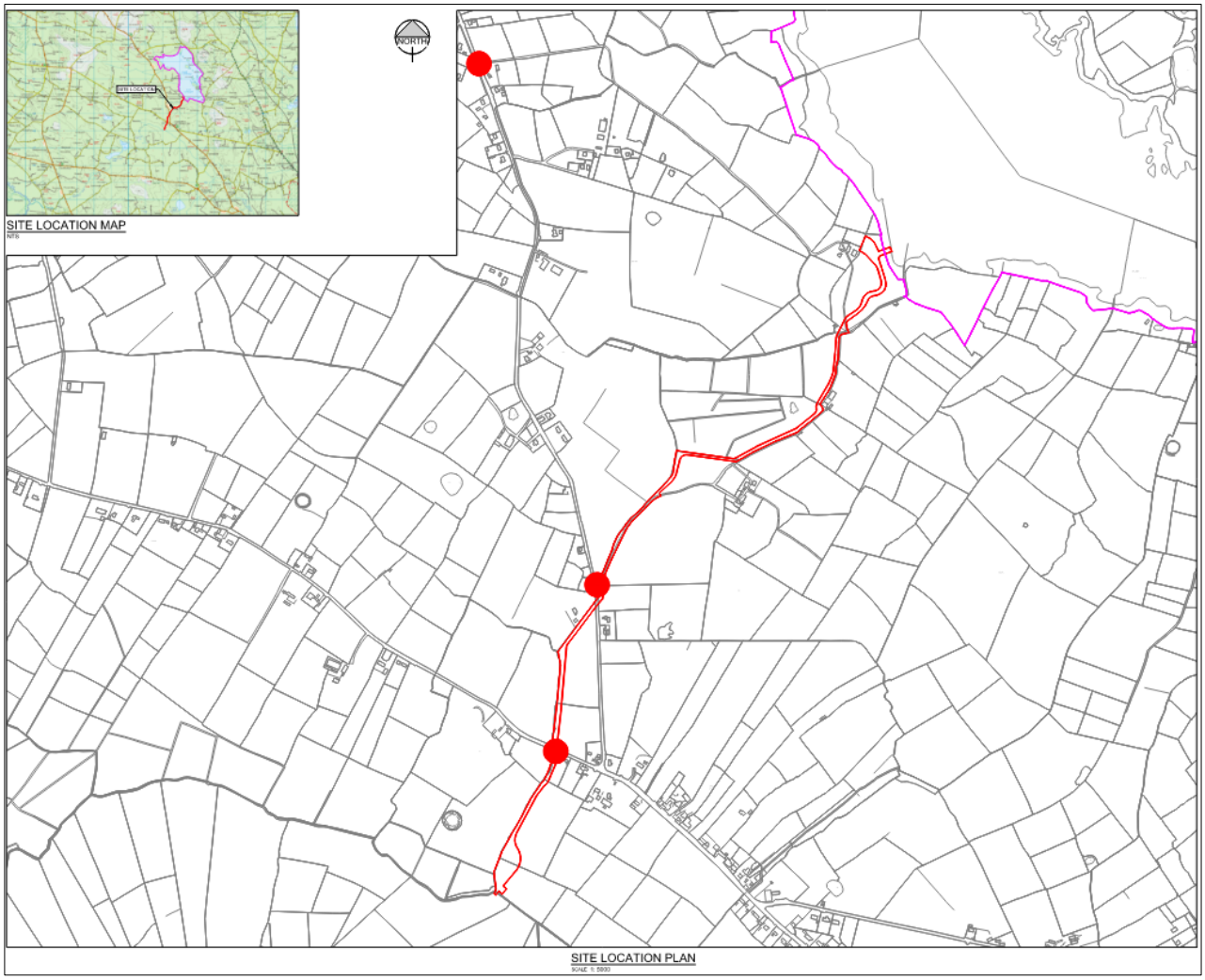

Figure 1 Location of Project Scheme. Source Dwg 24821-MWP-00-00-DR-C-0001 (MWP) | not to scale

3.2 Proposed Scheme Design

The main elements of the proposed scheme consist of:

- Intake pump system (located within the lough)
- Intake compound
- Pipeline route from the lough to the Cross River
- Pipeline outfall at the Cross River.

3.3 Intake Pump System

The intake pump system consists of:

- Floating pump pontoon incorporating 2 No. high capacity hydraulically driven pumps housed in a floating container with integrated fish screens
- 2 No. hydraulic power units (HPUs) (located in the bunded intake compound) to power the pumps
- 4 No. 3,000L double skinned fuel tanks (located in the bunded intake compound; and
- Floating access pontoon to provide safe access to the pontoon and support the hydraulic hoses which link the pumps to the HPUs.

Refer to Figure 2 for the layout of the intake pump system.

The intake pump system will include a facility to alter the pump flow rate as necessary, refer to Section 5.2 *Pumping Controls*.

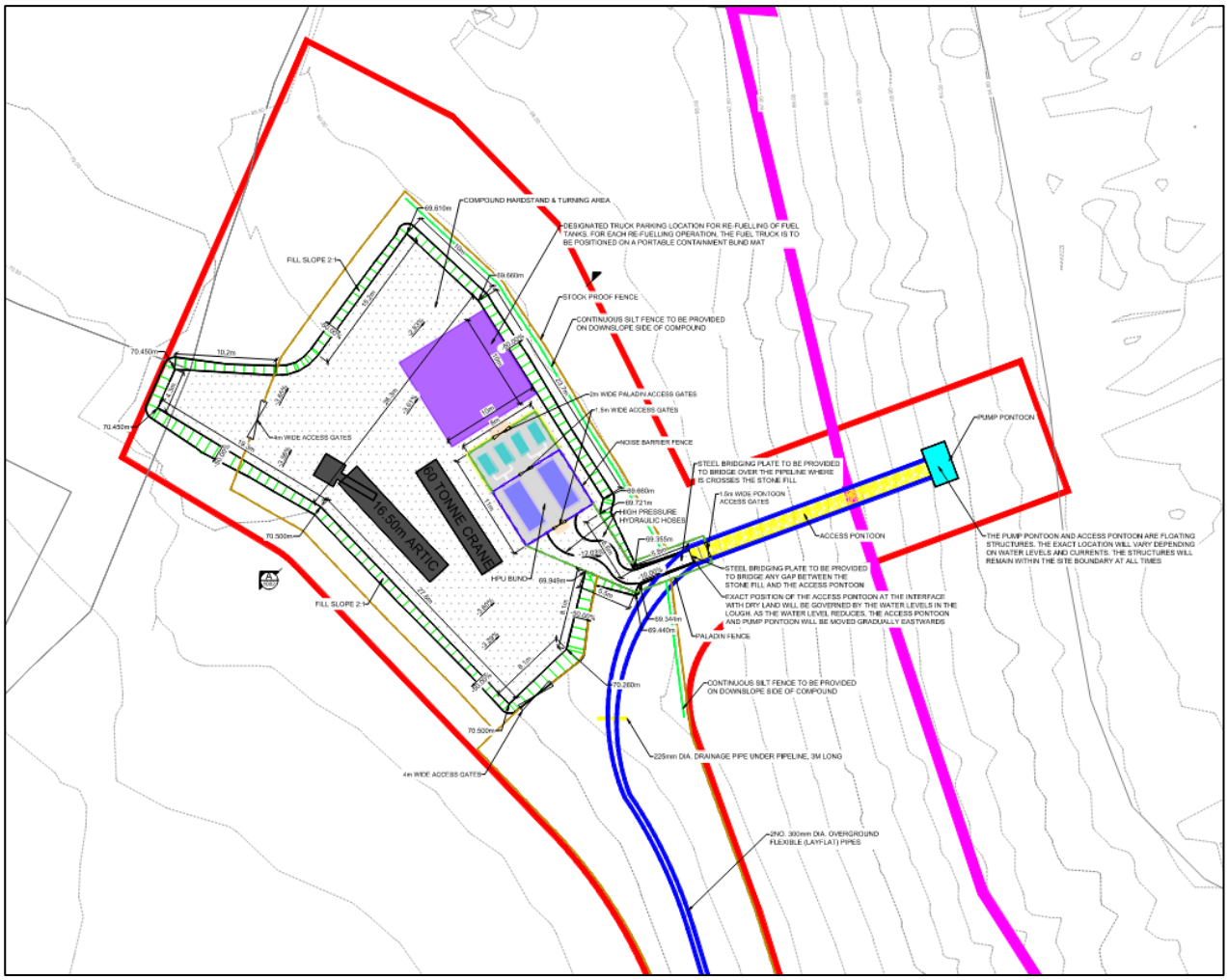

Figure 2 Proposed intake compound and pump layout. Source Dwg 24821-MWP-00-00-DR-C-1001 (MWP) | not to scale

3.3.1 Floating Pump Pontoon

The floating pump pontoon will consist of two submerged pumps enclosed in a container (2m x 1.2m x 4m), refer to Figure 3 from Drawing No. 24821-MWP-00-00-DR-C-1005 (MWP).

One vertical side of the container will be fitted with a 2m^2 mesh fish screen with a maximum opening of 10 mm. The approach velocity of the water entering through the mesh screen will be a maximum of 150 mm/second, at a total flow rate of 300 litres/second. This will ensure that juvenile fish can swim away against the current and not get entrained on the mesh.

The container will float due to the buoyancy tanks fitted and will also be stabilised in position by four 100 mm diameter poles with baseplates. As the poles are not for vertical support, minimal settlement of the poles into the ground is anticipated (less than 150 mm).

The pump pontoon will be accessible from land via the floating access pontoon.

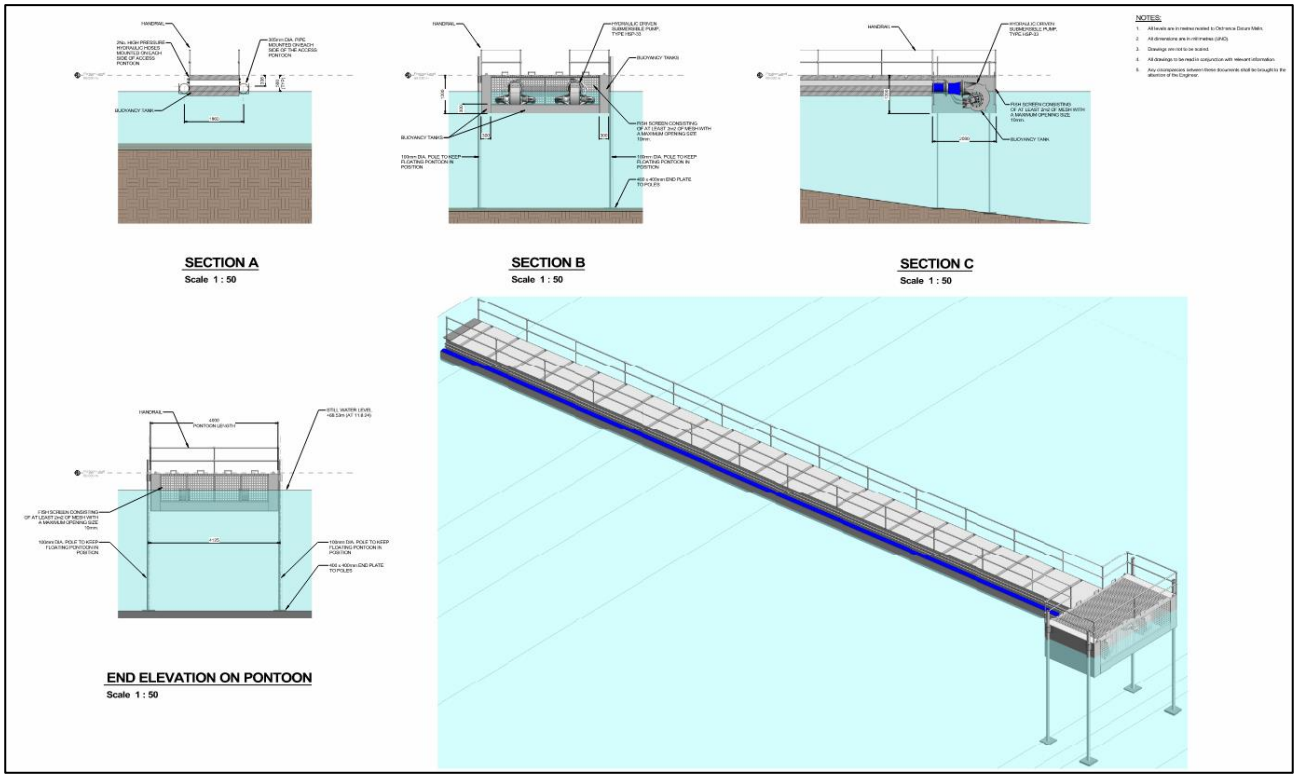

Figure 3 Design details of the pump pontoon (intake system). Source Dwg. 24821-MWP-00-00-DR-C-1005 (MWP) | not to scale

3.3.2 Floating Access Pontoon

The pump pontoon (and screen) will be accessible from land via a floating access pontoon, approximately 25.6 meters long that will extend from the lough edge, refer to Figure 4 below.

The access pontoon will support two pipes (305 mm diameter each) mounted on either side of the pontoon that will run from the pump pontoon and will be jointed to the two 300 mm diameter flexible ‘layflat’ pipelines.

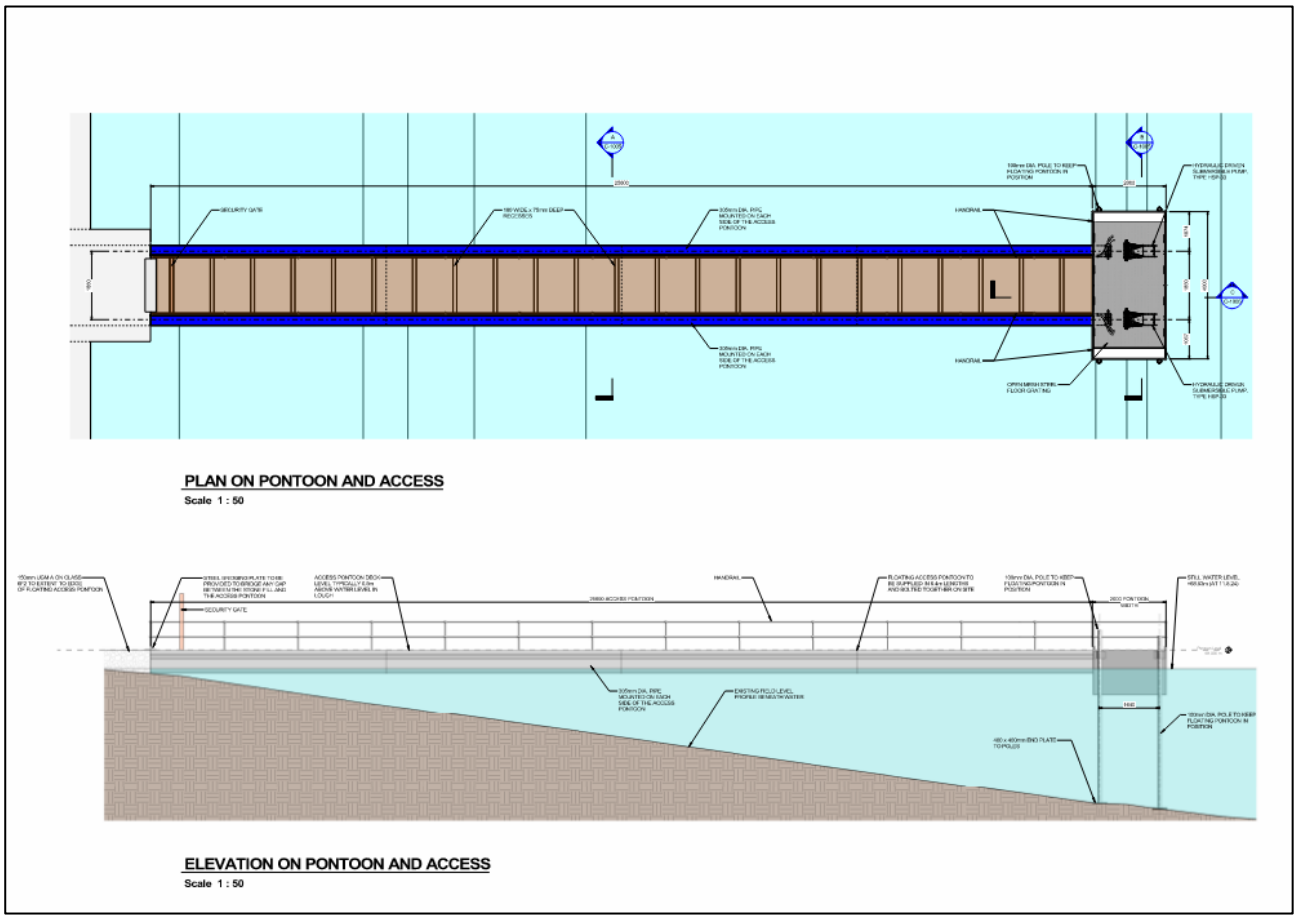

Figure 4 Configuration of the two pumps and floating pump pontoon. Source Dwg. 24821-MWP-00-00-DR-C-1004 (MWP) | not to scale

3.3.3 Pumping Rate and Pump Controls

The maximum flow rate has been selected taking consideration of the expected volume that needs to be removed from the lough in order to have a short-term meaningful beneficial impact and based on the flood risk assessment of the Cross River reach as well as with regard to the availability of the necessary high-capacity pumps.

Pumping will be undertaken only when the water level in the lough is above 67.5 mOD. As noted in the Engineering Report (Section 2.3, MWP 2024), the rationale for selecting a level of 67.50 mOD is that this is still above the pre-2016 “normal” maximum flood level indicated by the Lough Funshinagh Technical Subgroup (2024) and GSI (2016).

The two submersible pumps will operate in parallel with a total flow rate not exceeding 300 l/s.

The pump system together with the lake level and the flow in the Cross River will be monitored over the full duration of the scheme by Roscommon County Council.

3.4 Intake Compound

The overall area of the compound will be c 1,150 m^2. The intake compound is required to provide safe access for the delivery of the pump system components and to provide for safe and secure operation of the pumping system with appropriate protections in place to prevent contamination from a potential fuel spillage from the HPUs or storage tanks.

The intake compound consists of:

- 2 x 600 kW hydraulic power units (HPUs)
- 4 x 3,000 litre double skinned fuel tanks, 2 for each HPU

- Concrete bund for HPUs and fuel tanks (11 m x 8 m) and secured with paladin fencing.

The intake compound will be located on private agricultural land located on the lough's edge. The design and location of the compound has been chosen to eliminate the risk of inundation of the tanks and pumping machinery (HPUs). The lowest elevation of the compound will be 69.22 mOD. The compound will comprise a combination of a geotextile and geogrid placed directly on the grass over which a minimum thickness of 450 mm of stone will be placed as the compound base to ensure all plant and machinery will be above the peak flood height of March 2024 (69.37 mOD), refer to Figure 5 below.

In addition, the two 600kW hydraulic pumping units (HPUs) and four 3,000 litre diesel storage tanks will be located within a concrete bund with a minimum finished floor elevation of 70.50 mOD. The HPUs will each be placed on concrete plinths within the concrete bund, refer to Figure 6 below.

The HPU model to be employed will be a D600/A4VSO500 manufactured by Holland Special Pumps. Each unit measures approximately 4 m x 1.8 m x 2.35 m. The units are diesel powered with a fuel tank capacity of 100 litres housed within the HPU unit.

The HPUs will be connected to the pumps by two hydraulic hoses each via the access pontoon, refer to Figure 5 below.

The HPU sound level produced per unit is approximately 76dBA at 7 meters. To provide noise mitigation a 4 m high solid noise barrier will surround the HPUs, with an acoustically absorptive material facing the power packs.

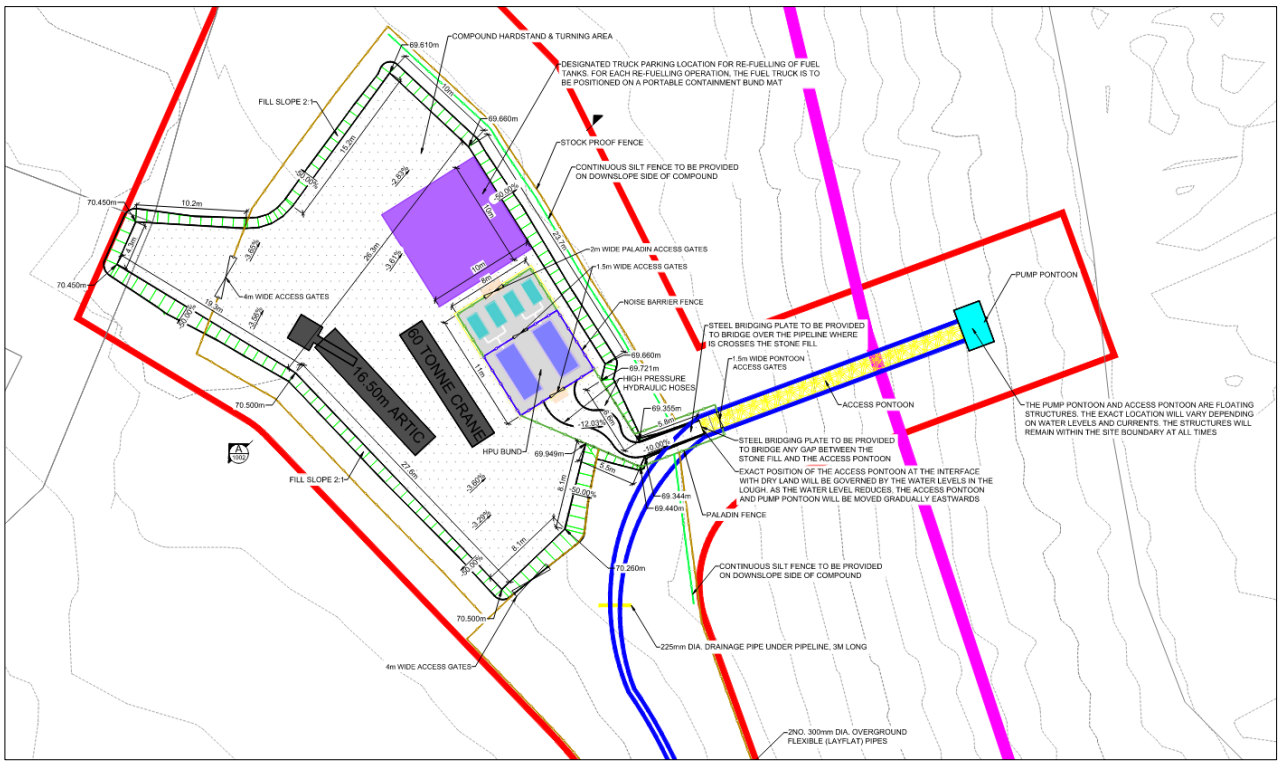

Figure 5 Intake compound, floating access pontoon and pump pontoon. Source Dwg. 24821-MWP-00-00-DR-C-1001 (MWP) | not to scale

3.4.1 Concrete Bund

As outlined above, both the HPUs and the four fuel tanks will be located within a reinforced concrete bund (11 m x 8 m base) with upstand walls to contain any fuel in the case of a spillage or leak. All fuel tanks are double skinned and in addition the bund will provide at least 110% storage capacity for 2 No. fuel tanks (i.e. 6,600 litres) plus an additional allowance for 75 mm of rainfall accumulation.

The finished floor level of the concrete bund will be 70.58 mOD, reducing to 70.50 mOD at the sump to allow for rainwater accumulation, refer to Figure 6 below. The sump will be provided at the lowest corner of the bund to enable rainwater to be pumped out at regular intervals during the operational phase. The upstand

walls also serve as a wheel stop to prevent vehicles accidentally impacting the fuel tanks during turning manoeuvres.

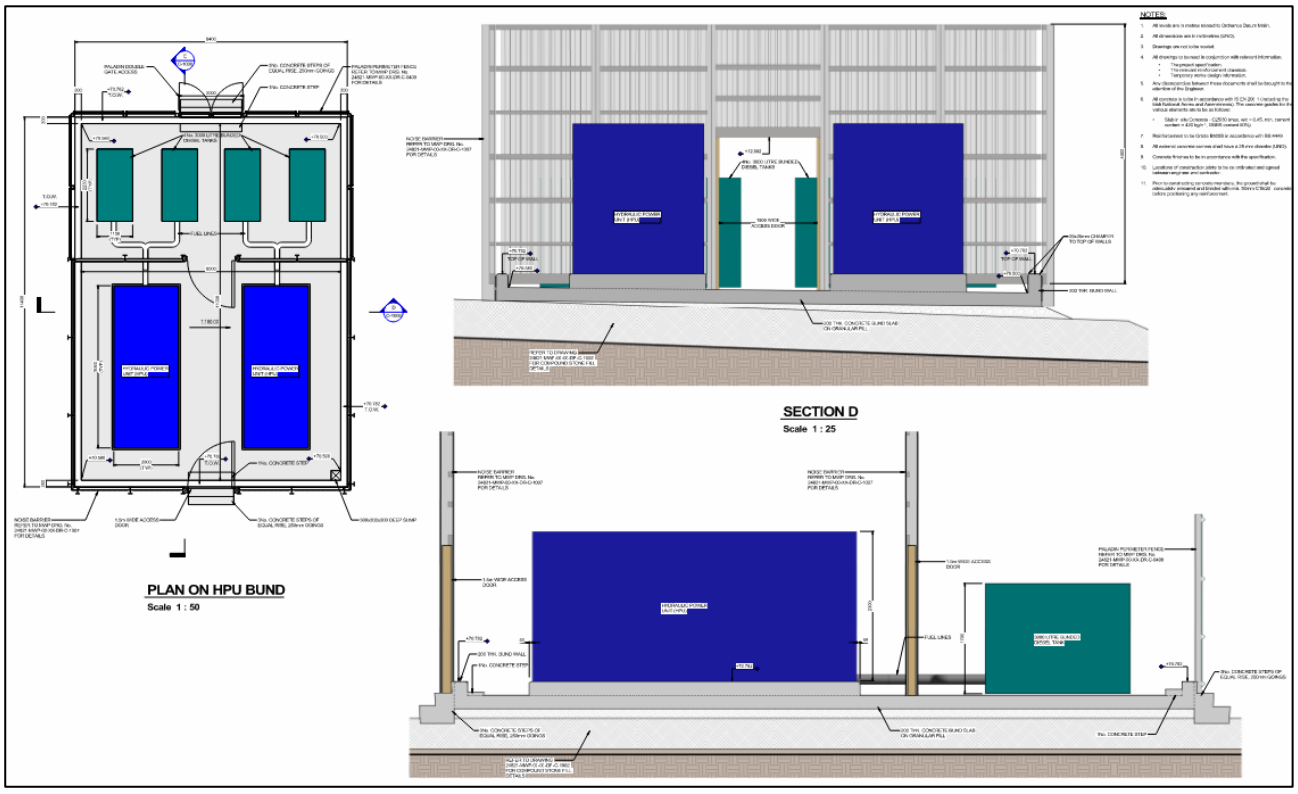

Figure 6 Configuration of concrete bund containing 4 no. fuel tanks and 2 no. HPUs. Source Dwg. 24821-MWP-00-00-DR-C-1006-S2-P03 (MWP) | not to scale

3.4.2 Compound Base

The compound base will be made up of a minimum thickness of 450 mm stone hardstand area suitable for vehicular traffic, including loading/unloading of delivery vehicles and fuel trucks. The total footprint of the hardstand area will be c. 1150 m^2. The hardstand area is sized to provide for safe truck turning within the compound. During construction the articulated delivery lorry (16.5 m long) and 60-tonne crane used to deliver and place the plant into position will utilise the hardstand area within the compound, refer to Figure 2 above.

3.4.3 Fencing and Security

A stock proof fence will be installed around the perimeter of the compound. An agricultural access gate (Figure 7) will be provided at the northern end of the compound to facilitate access. An additional gate will be provided at the southern end of the compound to enable the landowner to access the agricultural lands to the south.

For security and safety reasons, a paladin fence will be erected to secure the perimeter of the HPU/tank bund and access point to the floating access pontoon.

Access for the landowner to their lands will be maintained at all times.

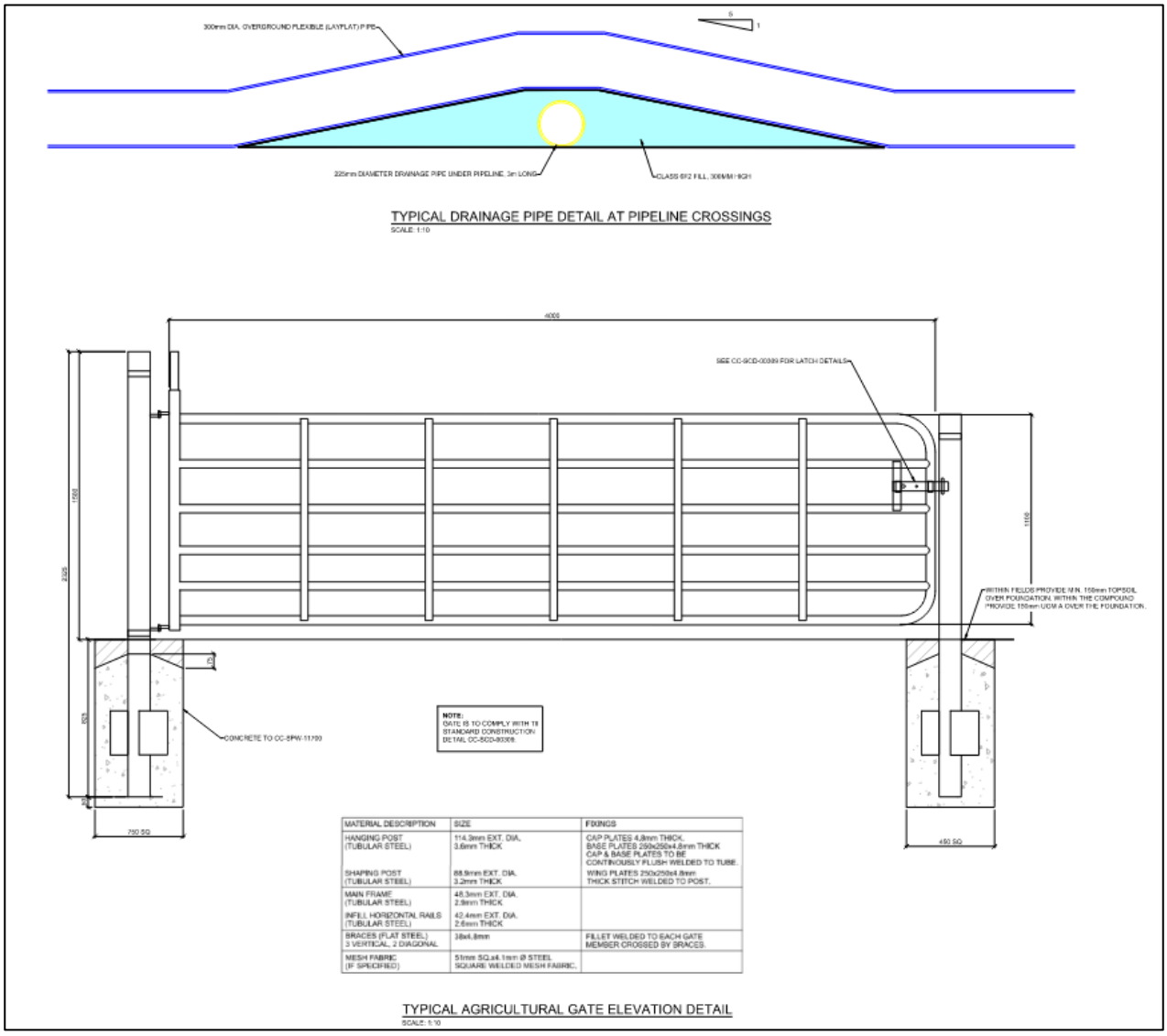

Figure 7 Agricultural gate design. Source Dwg. 24821-MWP-00-00-DR-C-0404 (MWP) | not to scale

3.5 Pipeline Route to the Cross River

The purpose of the pipeline is to convey the water from the pump intake system to the outfall at the Cross River. The route of the pipe has been selected so that it runs along property boundaries for the majority of its length as this will minimise disruption to landowners.

The total length of the pipeline will be 2.7 km:

- From the pump pontoon to the 2 No. 300mm diameter flexible pipes – c. 0.25 km
- From the 2 No. 300mm diameter flexible pipes to the PE ribbed pipe – 2.13 km
- From PE ribbed pipe to outfall at the Cross River (500 mm diameter PE ribbed pipe) – 0.32 km.

The pipe between the pump intake system and PE ribbed pipe will consist of two parallel 300 mm diameter flexible pipes covering a length of c.2 km from the intake system to a point 160 m south of the L2013 road and will comprise 50 m to 200 m lengths (typically 200m) of flexible pipe. These flexi pipe lengths will be jointed using bolted collars and placed on the ground and will operate under pressure with full bore flow. At full capacity each flexible pipe will weigh 77 kg per meter length. The pipeline will cross 10 existing hedgerows/ fences and at each crossing a 5 m gap will be cleared.

At the transition point south of the L2013, the flexible pipes will be connected via a manifold to a single PE ribbed pipe 500 mm in diameter (c.320 m long) which will terminate at the outfall to the Cross River.

The PE ribbed pipe will operate under gravity flow and will flow half full at a velocity of c.4.10 metres/second when the pumps are discharging at a rate of 300 litres/second.

The PE ribbed pipe will consist of lengths varying between 5m and 12 m of jointed pipe laid directly on the ground and will operate under gravity along the downhill approach to the outfall which has a gradient of approximately 3%. At full capacity the PE pipe will weigh 109kg per meter length. Settlement is not likely to exceed 50 mm for flexi pipe and the PE ribbed pipe.

Due to badger activity in the field where the PE ribbed pipe will be placed, a provision will be made for badgers to cross the PE ribbed pipe by constructing a ramp over the pipe.

Sections of pipe will also be provided through the fencing to facilitate movement of badgers in the area across the stock proof fencing.

3.5.1 Fencing

The pipeline route will where possible be located parallel and adjacent to property boundaries and existing fencing and hedgerows to minimise the disruption to landowners. The route will be fenced off with wooden post and wire fencing to prevent livestock and people from interfering with the pipeline. The fencing will provide a clearway of 5 m to 7 m wide to allow for a vehicle to access the pipeline route for routine inspections.

All fencing will be removed on completion of the pumping works.

The pipeline will be inspected daily to check for leaks or damage.

3.5.2 Road Crossings

The pipes will run overground throughout except at road crossings, which will be required at three locations:

- Private access road adjacent to the R362 road
- R362 regional road
- L2013 local road.

These road crossings will consist of two 600 mm diameter PE ribbed carrier pipes laid under the road, through which the pair of flexible pipes can be routed. These will be installed by open excavation followed by backfilling of the trench and reinstatement of the road. A short section of open excavation will remain on both sides of each crossing. The existing hedgerow will be removed on both sides of the road over a width of approximately 5m.

The pipeline will be installed in two segments such that only partial road closure will be required for up to two days at each public road crossing location. One lane of traffic will be kept open to maintain traffic flow.

3.6 Outfall

The outfall at the Cross River has been designed to prevent potential erosion of the riverbanks and bed. The outfall consists of the following key features (Figure 8 below):

- A geotextile layer will cover the riverbed and extend up both the sides of the riverbanks.
- Rock armour will be used to hold the geotextile in position, prevent erosion and dissipate energy from the pipeline.
- A diffuser tee fitted will be fitted at the end of the PE ribbed pipe to dissipate energy and distribute the flow over a larger area of riverbank. The tee will have a series of 36 no. 80 mm diameter holes drilled at 120 mm spacing on the side opposite to the PE ribbed outfall pipe.
- Rock armour will be built up around the ends of the diffuser tee to further dissipate the energy from water discharging from the ends of the tee.

- A 1.60 metre width of the riverbed will be covered with natural flag stones to hold the geotextile in place and to allow unhindered fish passage, as recommended by Inland Fisheries Ireland. The top of the flags will have an exposed aggregate finish. The leading edge and tail edge flags at the upstream and downstream interfaces with the existing riverbed will be level with the existing riverbed to avoid localised erosion.

At the outfall location, as detailed above, a geotextile layer will cover the riverbed and extend up the side of the riverbanks on both sides to protect the integrity of the riverbed from potential erosion from the outflow. The central part of the riverbed will remain free from rock armour so as not to impede fish passage. The geotextile will extend over a length of 10 m, centred on the outflow location (5 m upstream and 5 m downstream of outflow).

Natural flag stones with an exposed aggregate finish will be placed over a 1.6 m width of the riverbed with the leading edge and tail edge of the flags at the upstream and downstream interfaces placed level with the existing riverbed to avoid localised erosion.

The geotextile will be held in place by rock armour which consists of 200 kg rocks approximately 0.5 m in diameter. The types of rock used will be strong, inert rock, free from cracks/ joints to ensure the rock will not break down and affect the river environment.

The water from the outfall pipe will run onto the rock armour on the north (left) bank and this will dissipate the energy of the flow and allow it to enter the river in a controlled manner without causing erosion. Due to the significant depth of the channel, the diffuser tee will remain well above the water level in the river when pumping is being carried out.

The geotextiles, flags and rock armour will remain in place for the duration of the interim scheme. The geotextiles, flags and rock armour will be removed on the completion of the scheme.

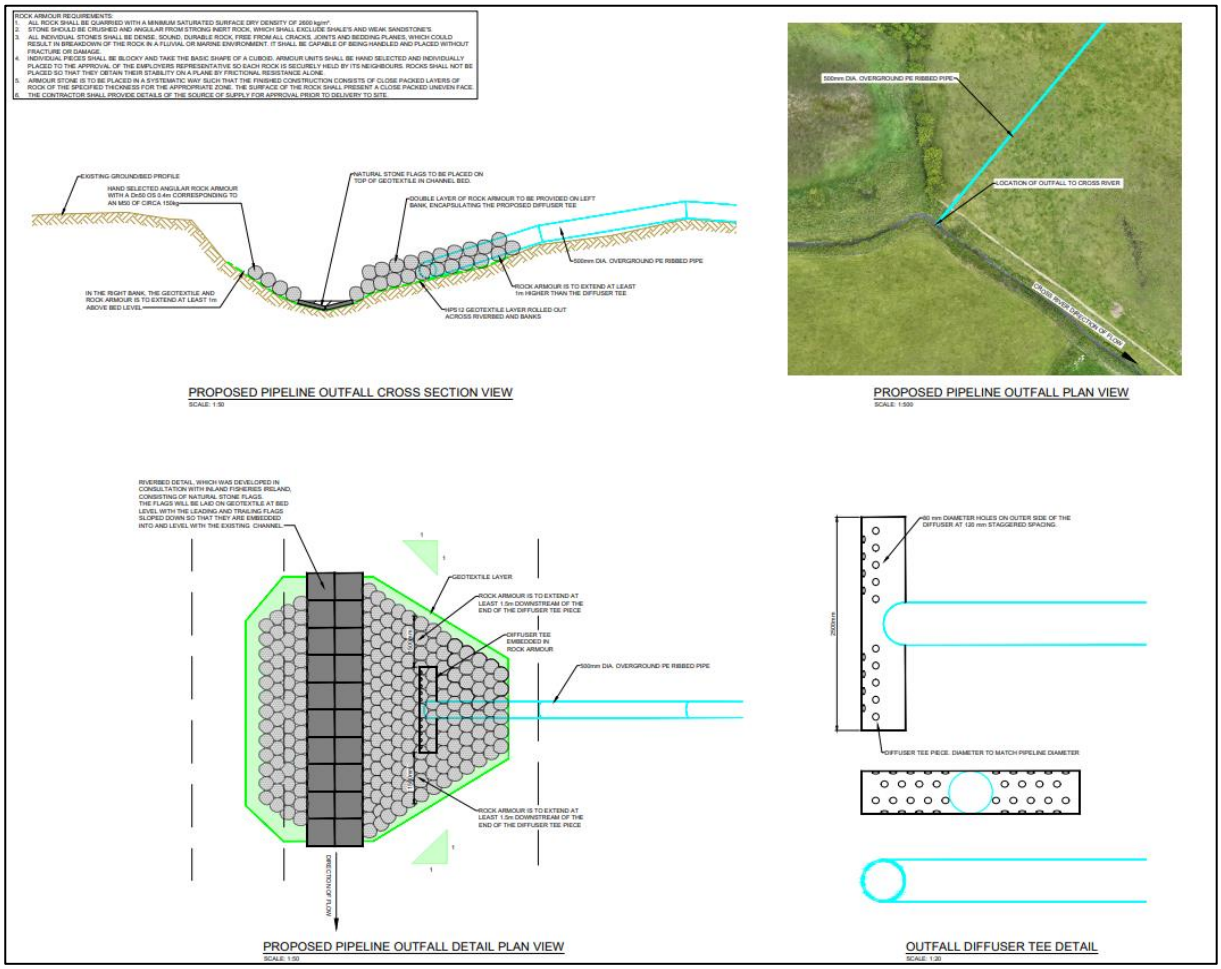

Figure 8 Outfall design. Source Dwg. No. 24821-MWP-00-00-DR-C-1003 (MWP) | not to scale

4. Construction of the Proposed Works

This section describes the works required to construct, install and commission the proposed scheme.

4.1 Phasing of works

Some works may be carried out concurrently where possible however the overall phasing of the works will likely be as follows:

- Construction of the intake compound
- Installation of the pump intake system i.e. HPUs, pump pontoon and floating access pontoon
- Laying of pipeline along the pipeline route including road crossings and fencing
- Installation of outfall; and
- Equipment installation and setup.

It is anticipated that the construction works will take approximately one month to complete. It is expected that the civil works will be completed in 3-4 weeks and that the installation and setting up of equipment will take one week.

4.2 Intake Compound

The compound will be constructed without excavating the existing ground. A combination of geogrid and geotextile will be placed over the vegetation on the existing surface within the footprint of the compound. A minimum thickness of 450 mm of imported stone (Class 6F or similar) will be placed on top of the geogrid and geotextile. The total footprint of the hardstand area at the will be c. 1,150 m^2.

A site inspection by the design engineering team and landowner knowledge of the land have determined the ground conditions to be suitable for the size and nature of compound designed for the proposed scheme.

4.2.1 Intake Compound

The construction of the intake compound will involve the following sequence:

- The appointed contractor will mark out the line of the proposed compound using a GPS / total station
- A layer of geogrid / geotextile will be rolled out by hand along the line of the proposed compound
- The stone aggregate used to construct the compound will be imported from a local quarry using trucks. The trucks will reverse tip the stone onto the geogrid / geotextile and an excavator will be used to spread the stone before compaction. Compaction of the stone material will be completed using the Transport Infrastructure Ireland (TII) Specification for Roadworks. This is typically completed in layers with the use of a vibratory roller or similar
- The compound will be constructed with a minimum crossfall of 3% to ensure that water can flow off the surfaces and to reduce the risk of rutting / potholes occurring
- Surface water runoff from the compound will be discharged directly over the edge of the stone embankment and a continuous silt fence will be constructed on the downslope side to capture any sediment that may run off the surfaces
- The timber posts in the stockproof fence will be driven into the existing soil without any excavation.

4.2.2 Concrete Bund

- A concrete bund measuring 11 m x 8 m will be constructed inside the compound to support the HPUs and fuel tanks and to contain any fuel in the event of a spillage. The slab will be cast directly onto the imported stone used to construct the compound. The slab will include reinforcement to prevent leakage. The upstand walls will be cast in-situ using conventional formwork
- The acoustic barrier, 4 m in height, will be fixed directly to the HPU bund upstand walls or slab
- The paladin fence posts will be secured to concrete blocks (Kelley Blocks or equivalent) so as to avoid disturbance of the underlying ground. Refer to the drawing in Figure 9 for details of fences.

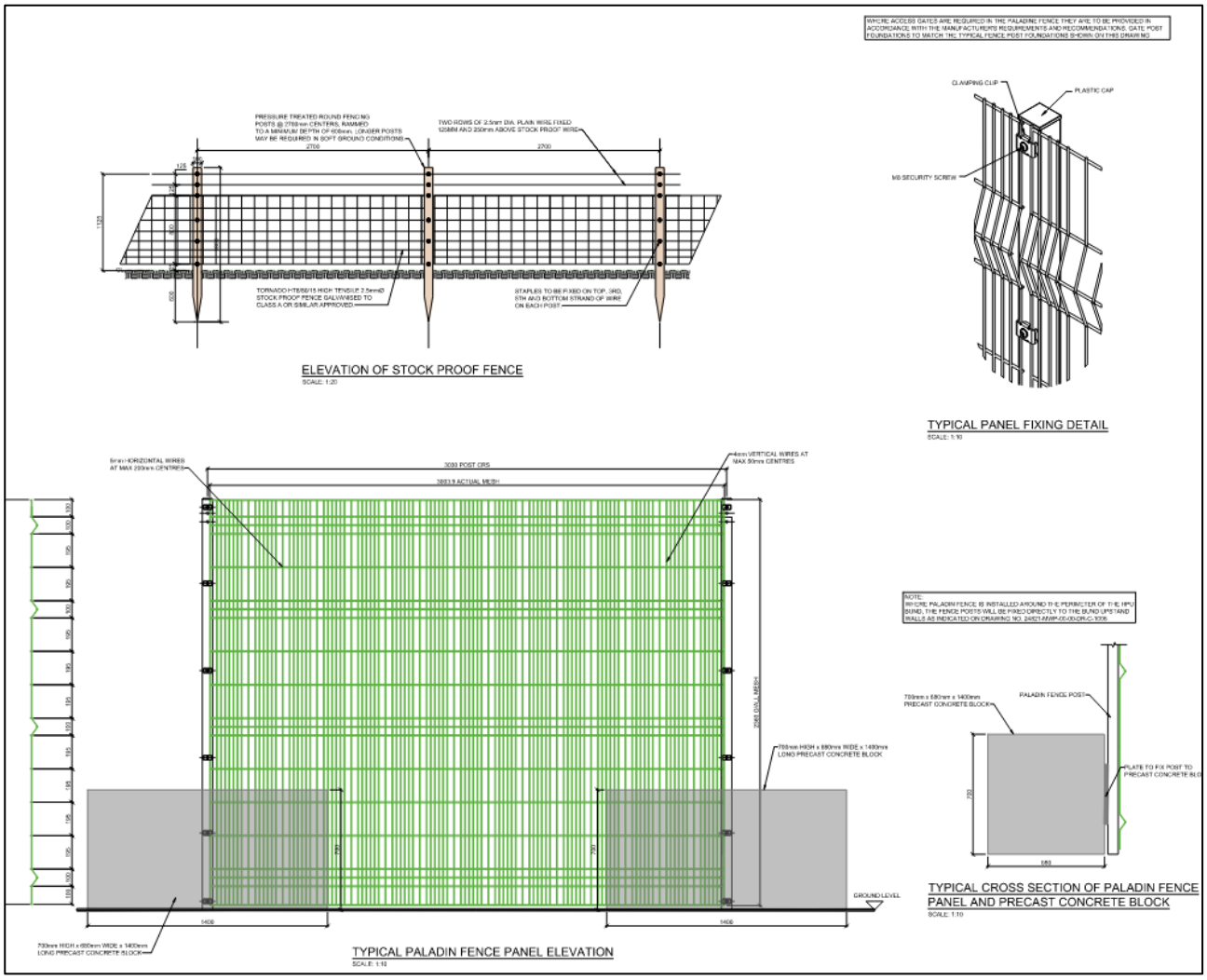

Figure 9 Design detail of paladin fence installation. Source Dwg. 24821-MWP-00-00-DR-C-0403 (MWP) | not to scale.

4.3 Pump Intake System

The construction of the pump intake system will involve the following sequence:

- The pump pontoon and access pontoons will be manufactured in the Netherlands and will be transported to site on an articulated truck. The HPUs and fuel tanks will also be transported from the Netherlands on an articulated truck. The trucks will deliver all these components to the intake compound
- A 60-tonne mobile crane will be used to lift the pump pontoon (with the pumps already installed within it) from the truck in the compound to the lough. The pump pontoon will be floated into its final position and held in place horizontally using 4 no. spud legs (100 mm diameter) fixed with end plates, which will rest on the ground beneath the water. A small boat will be in the water to assist with positioning
- The same crane will lift the HPUs and fuel tanks into position within the HPU bund.

- The floating access pontoons will be transported to the site in 5 no. 6.4 m lengths. Each section will be lifted into position in the lough using the crane and bolted together.
- The hydraulic hoses and 2 no. c.300 mm diameter pipes will be mounted on the sides of the floating pontoons using brackets.
- The fuel tanks will be filled with diesel using a fuel truck.
- The pump system will be tested and, after installing the remainder of the pipeline, it will be commissioned.

4.4 Pipeline Route to the Cross River

4.4.1 Laying of Pipeline

Vegetation clearance will be required where the pipes must cross ditches however only space for the two pipes will be required and these locations will be replanted on removal of the temporary pipeline. Similarly, it may be necessary to cut through concrete walls or dismantle stone walls to allow the pipeline through such boundaries. All such boundaries will be reinstated once the pipeline is removed.

The construction of the pipeline will involve the following sequence:

- The flexible layflat hose and PE ribbed pipe system will be supplied from the Netherlands and will be transported to site on articulated lorries
- The layflat hose will be supplied in 50 m to 200 m lengths (typically 200 m) and will be housed in a container for transport. The container will be lifted off the trucks and onto a flatbed trailer which will be attached to a tractor or excavator. The tractor or excavator will drive along the route of the pipeline and deploy the hose directly onto the ground surface. The final positioning of the hose will be done by hand
- The pipeline will need to pass through a number of field boundary fences/hedgerows, as shown on the engineering report drawings (24821-MWP-00-00-DR-C-0100, 24821-MWP-00-00-DR-C-0101, 24821-MWP-00-00-DR-C-0102, 24821-MWP-00-00-DR-C-0103). At each location, the existing boundary fence/hedgerows will be removed over a width of 5 m which is required to allow both the pipeline and a tractor/excavator to pass through
- Cross drains consisting of HDPE drainage pipes will be laid directly on the ground beneath the layflat hose at appropriate intervals to maintain the existing drainage regime on the site. This approach eliminates the need to excavate new drainage channels or alter the existing flow regime
- The PE ribbed pipeline will be supplied in lengths varying between 5 m and 12 m and will be connected using rigid joints. The pipe sections will be loaded from the articulated lorry to a flatbed trailer attached to a tractor or excavator. The tractor or excavator will drive along the route of the PE ribbed pipe and will be followed by an excavator which will be used to lift the pipes from the trailer to the required position on the ground
- Due to the existing surface condition, which has a number of localised humps and depressions, the line of the 500 mm diameter PE ribbed rigid pipe will be smoothened out. This will be achieved using an excavator to compact and level out any localised humps/depressions. The maximum depth change will be 150 mm which is less that the depth of influence in conventional agricultural tilling
- The layflat flexible pipe will be connected to the PE ribbed pipe using a bespoke fabricated manifold section
- A provision will be made for badgers to cross the PE ribbed pipe by installing ‘Badger Gates’ in the fencing. This consists of sections 300 mm diameter pipe placed through and perpendicular to the wire fencing to allow badgers to travel through.

4.4.2 Fencing Installation

A stock proof fence will be provided both sides of the pipeline along the full length of the route and will incorporate timber posts which will be driven into the existing soil without any excavation. The stock-proof fence will consist of wooden post and wire fencing. Refer to Figure 9.

4.4.3 Road Crossings

There will be two public road crossings along the route (the R362 and L2013) and one crossing of a private road. A shallow trench will be excavated across each road and a concrete pipe installed through which the flexible pipes will subsequently be pulled. It is anticipated that the trenching works will take up to two days for each installation and one lane of traffic will be kept open to maintain traffic flow. It is known that an existing Uisce Éireann watermain and a fibre optic cable are present in the roads.

The construction of road crossings will involve the following sequence:

- On the public roads, in order to allow traffic to continue to use the roads, the pipe will be installed in two segments such that at least one traffic lane remains open at all times
- Prior to undertaking any works, a CAT scan will be undertaken to identify any services in the road
- An 1800 mm wide trench will be excavated across the road to accommodate 2 no. 600 mm diameter HDPE carrier pipes. The overall trench depth will be approximately 2,000 mm to provide sufficient cover to the pipe and to ensure that the existing services can be avoided
- The HDPE carrier pipe will be positioned onto a 100 mm thick layer of pipe bedding material placed at the bottom of the trench. Once the carrier pipe is in position the trench will be backfilled and the road will be reinstated
- The existing hedgerow will be removed on both sides of the road over a width of approximately 3 m. These will be reinstated following installation of the carrier pipes
- At each side of the road, the trench will extend past the pipe into the field and will be sloped upwards to meeting the existing field level as shown Figure 10 and Figure 11. A handrail will be erected around the trench in the field
- The flexible pipes will be placed through the carrier pipe.

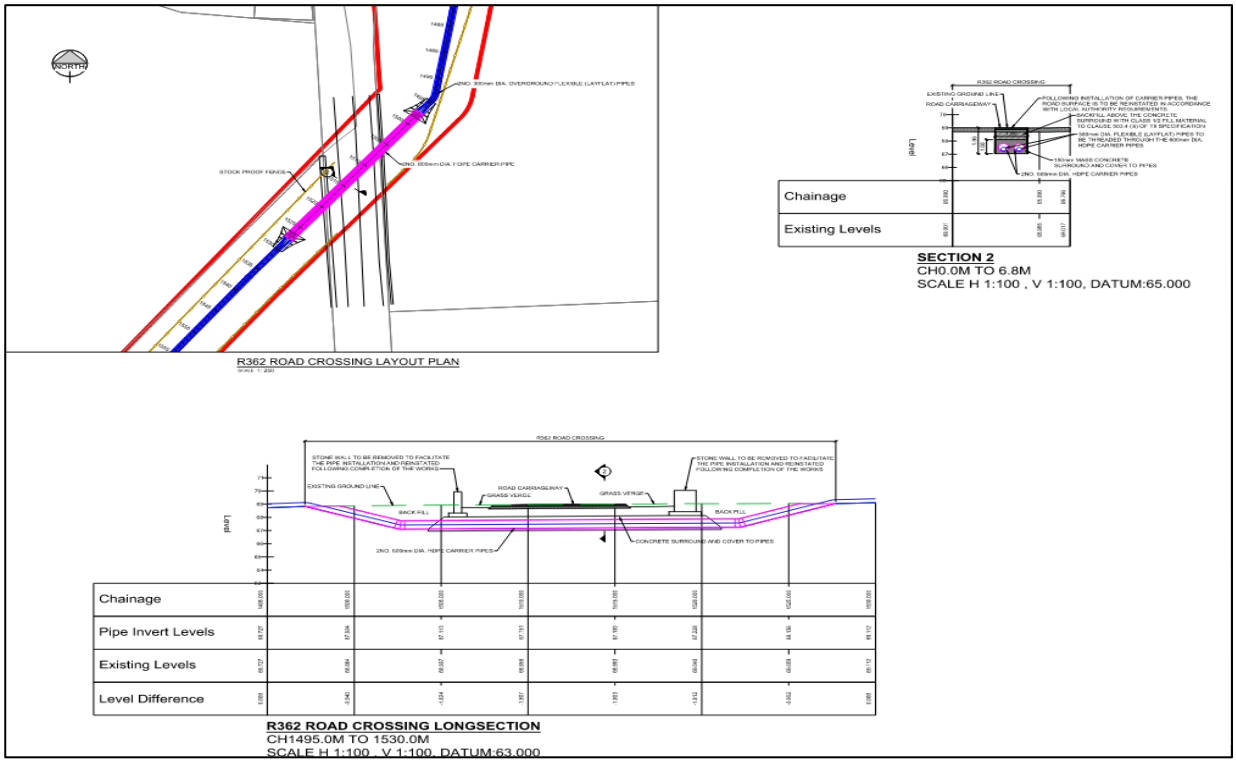

Figure 10 Proposed R362 road crossing detail. Source Dwg. 24821-MWP-00-00-DR-C-0401 (MWP) | not to scale

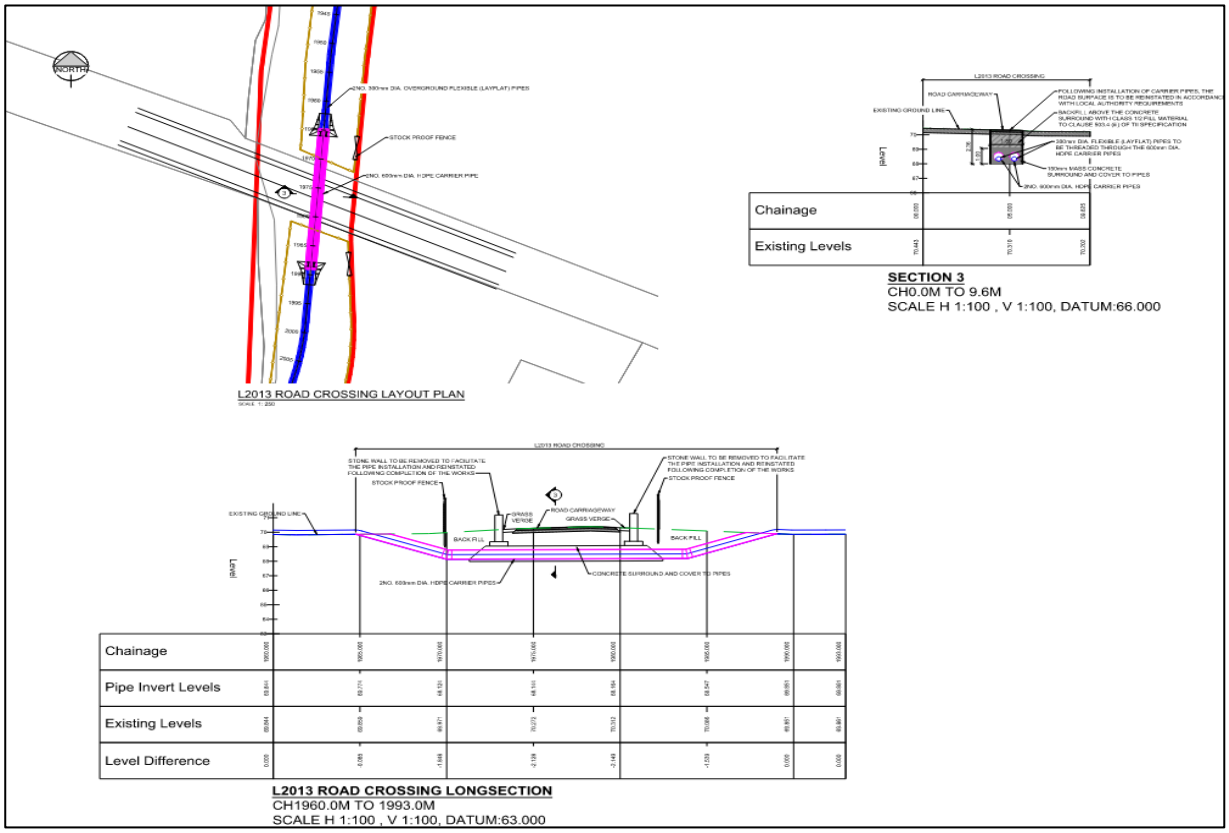

Figure 11 Proposed L2013 road crossing detail. Source Dwg. 24821-MWP-00-00-DR-C-0402 (MWP) | not to scale

4.5 Outfall

No excavation works or vegetation removal will be required at the outfall location.

The construction of the outfall will involve the following sequence:

- The geotextile will be supplied in a roll and transported to the outfall location by an excavator
- The rock armour and natural flag stones will be transported to the outfall location using a tipper truck or tracked dumper
- As noted on drawing 24821-MWP-00-00-DR-C-1003:
  - All rock shall be quarried with a minimum saturated surface dry density of 2600 kg/m³
  - Stone should be crushed and angular from strong inert rock, which shall exclude shales and weak sandstones
  - All individual stones shall be dense, sound, durable rock, free from all cracks, joints and bedding planes, which could result in breakdown of the rock in a fluvial or marine environment. It shall be capable of being handled and placed without fracture or damage
  - Individual pieces shall be blocky and take the basic shape of a cuboid. Armour units shall be hand selected and individually placed to the approval of the Employers Representative so each rock is securely held by its neighbours. Rocks shall not be placed so that they obtain their stability on a plane by frictional resistance alone
  - Armour stone is to be placed in a systematic way such that the finished construction consists of close packed layers of rock of the specified thickness for the appropriate zone. The surface of the rock shall present a close packed uneven face
  - The contractor shall provide details of the source of supply for approval prior to delivery to site.

- The geotextile will be rolled out across the full width of the channel from top of bank to top of bank
- An excavator will be used to systematically position rock armour and natural flag stones onto the geotextile, starting at the bottom and working upwards to ensure stability is maintained. The finished construction consists of close packed layers of rock of the specified thickness for the appropriate zone
- The PE ribbed pipe will be laid as far as the top of the channel bank using the method outlined in the previous sub-section. The pipe will be mitre cut and jointed to another pipe section by fusion welding a coupler so that the jointed section will be oriented downwards following the riverbank gradient
- The diffuser tee will have been prefabricated and will be fixed to the end of the pipe with a rigid joint
- Additional rock armour will be placed around the ends of the diffuser tee to ensure that water discharging from the ends must flow around and through the rock armour before entering the river.

4.6 Service Diversions

Services will potentially be encountered during the road crossing works. As noted above in Section 4.4.3, the overall trench depth will be approximately 2,000 mm to provide sufficient cover to the pipe and to ensure that the existing services can be avoided.

4.7 Traffic Management

As noted in Section 4.4.3, traffic management measures will be required during the installation of the pipeline under the public roads. One lane of traffic on the public roads will be maintained at all times.

4.8 Environmental Management During Construction

4.8.1 General

A construction environmental management plan (CEMP) has been prepared and will be updated throughout the duration of the proposed scheme. The CEMP is included as part of an information pack for the proposed scheme

Every effort will be made to ensure that any detrimental environmental effects will be avoided, prevented or reduced during the construction phase of this project.

The CEMP comprises all of the construction mitigation measures, which are set out in this report and the following reports submitted with the statutory approval application:

- Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) Report
- Ecological Impact Assessment Report
- Archaeological Impact Assessment Report
- Water Framework Directive Assessment.

The CEMP will be updated by RCC with any additional measures which are required by the statutory consent conditions and will be provided to the appointed contractor.

Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum. The plan will have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

4.8.2 Waste Arising

All waste arisings during construction will be managed in accordance with the waste hierarchy, in compliance with the provisions of the Waste Management Acts, 1996, as amended, and to contribute to achieving the objectives set out in the Waste Action Plan for a Circular Economy (DECC, 2020).

4.9 Landowner and Community Liaison

Roscommon County Council (RCC) will coordinate communications and liaise with affected landowners and the local community during all phases of the proposed scheme. RCC will liaise with residents and the general community during the construction phase to ensure that any disturbance is kept to a minimum and to ensure that all anticipated nuisances are minimised, and that the construction activity will have the lowest possible impacts on the residents and other properties.

4.10 Construction Management

RCC will have a construction management team on site for the duration of the construction phase. This team will supervise the construction of the scheme including monitoring the contractors' performance to ensure that the proposed construction phase mitigation measures are implemented, and that construction impacts, and nuisance are minimised.

4.11 Construction Safety

All contractors and subcontractors must progress their works with reasonable skill, care and diligence and, at all times, proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out construction works, pedestrians, road users and other interacting stakeholders. Measures related to construction health and safety are detailed in the CEMP.

A Project Supervisor Design Process (PSDP) has been appointed by RCC.

RCC will appoint the Project Supervisor Construction Stage (PSCS) for the construction stage of the project to manage and co-ordinate health and safety matters during the construction stage. The PSCS will be appointed before the construction work begins and remains in that position until all construction work on the project is completed.

5. Operations & Maintenance Activities

RCC will appoint an operations contractor to oversee all operations and maintenance activities.

5.1 Maintenance Activities

During the operation of the proposed scheme, the following maintenance activities will be required:

- Daily inspection of pumps and fish screen
- Daily inspection of pipeline route and fencing
- Daily inspection of outfall location
- Regular refuelling
- Periodic service of pumps and HPUs
- Weekly check of compound drainage; and
- Daily emptying of rainwater from dry sump.

The pump intake screen will be inspected daily to ensure proper operation of the pumps and to check for any blockages or damage to the fish screens. If the fish screens become blocked, they can be cleared by an operative who can safely reach the screens from the access walkways as required.

5.2 Pumping Controls and Monitoring

5.2.1 Pumping Duration

It is anticipated that the pumps will operate 24 hours a day at a combined flow rate not exceeding 300 l/s, as necessary to meet the scheme objectives for a period of up to 24 months.

Pumping will also depend on the flow rates of the Cross River which will be continuously monitored. Pumping will be reduced/halted as needed to eliminate any risk of downstream flooding of the Cross River.

5.2.2 Monitoring

The following aspects of the proposed scheme will be continuously monitored by RCC and data will be accessible remotely:

- The level of Lough Funshinagh
- Pumping rate of the HPUs; and
- Flow rate of the Cross River.

Currently, hourly readings of the lough's water level are being recorded and monitored daily by GSI[2]. Lake levels will be monitored daily as it is expected that the change in lake level as a result of pumping will be relatively slow.

The pumping control system will be remotely monitored by RCC and if required the pumping flow rates will be adjusted or shut off. The pumping controls will not be automatically regulated based on monitoring data.

The flow in the Cross River will be monitored at three locations by OPW hydrometric gauges at 15-minute intervals for the duration of the interim scheme. One location is an existing EPA flow gauge, Summerhill Station (26221), located approximately 13.7 km downstream from the pipeline outfall.

An additional two hydrometric gauges will be installed and operated by the OPW, one at Curraghboy approximately 0.9 km downstream of the pipeline outfall and one at Atteagh approximately 5.2 km downstream of the pipeline outfall.

The Cross River flow rate will be monitored continuously to assess if the trigger flows have been reached. The details of trigger flows are provided in the MWP engineering report. Regional flood warnings will be checked daily.

5.2.2.1 OPW installations of hydrometric gauges

Two new hydrometric gauges will be installed and operated by the OPW under its own statutory powers, at Curraghboy and Atteagh, Co. Roscommon. Both gauges will be installed on the left bank of the Cross River upstream of the adjacent road bridges. All installation works will be undertaken by the OPW according to their standard procedures (e.g. Activity Risk Assessments, Safe Operating Procedures Preliminary, Safety & Health Plan, and Job Safety Plans.). All installation works will be supervised on site by a OPW Project Supervisor Construction Stage following agreement and planning of works prepared by the OPW Project Supervisor Design Process.

OPW Installation Methodology

The installation of the hydrometric gauges will follow the methodology set by the OPW:

- The location of the station enclosure plinth will be scanned with a Cable Avoidance Tool prior to any excavation taking place
- A small excavation (maximum depth of 0.15 m) will be required to facilitate the construction of the concrete plinth (~0.6 m^2)

[2]Available at: https://gwlevel.ie/?place=00011_001_tl_gs

- A prefabricated timber shutter (~ 0.8 m x 0.8 m x 0.15 m) will be positioned and pinned where the concrete plinth is to be cast. The shutter will then be lined with polythene on the base and sides to prevent any cement paste from escaping. Sandbags to be positioned on the riverside of the shutter to contain any residual spillage
- Concrete will be transported from the designated mixing location via barrow on a route protected with polythene. Approximately 0.1 m^3 of concrete will be required for the plinth. The concrete is then placed, screed and finished with a steel trowel. Once the concrete is cured shutters are removed
- A staff gauge (~1.2 m high) will be attached to the existing rock armour (Curraghboy) or bridge abutment (Atteagh) using proprietary fittings and mechanical fixings. The staff board itself will be 150 mm x 44 mm untreated timber with staff plates fitted using stainless steel screws or galvanized nails
- The sensor ducting will be extended the river channel and connected the station
- A solar panel will be installed to provide power to the station
- Once all installation works are completed, a final check will be carried out to ensure any excess materials or equipment are removed off site.

OPW Maintenance and Calibration

The gauges transmit the data every 15 minutes to a central server that is available to the public to view on OPW's waterlevel.ie. The gauges are typically visited on a six-weekly cycle by a regional team consisting of a Technician and Driver. This team is assigned to the station and carries out all maintenance and calibration duties at the site

5.3 Intake Compound

5.3.1 Fuel Storage Tanks

A maintenance contractor will be appointed by RCC who will oversee the maintenance of all aspects of the pumping operation.

It is anticipated that the four fuel storage tanks will need to be refilled every fourth day with a fuel tanker making deliveries to the compound. The following maintenance activities will be required during the operational phase at the intake compound:

- **Refuelling**- The hydraulic pumps will each have a running time of about 100 hours on full fuel tanks therefore refuelling will be required every fourth day while pumping is ongoing. This will involve a fuel tanker driving into the Intake Compound and delivering fuel to the tanks which are located within the bunds. Appropriate mitigation measures to manage spill risks are detailed in Section 5.5.2 and the CEMP.
- **Emptying of rainwater** - Rainwater from the HPU bund will need to be emptied daily by pumping the rainwater from a dry sump using a light duty puddle pump and discharging the water in a distributed manner onto the grassed surface at a location where the buffer distance is at least 15m to the lough edge.
- **HPU Service** - The HPUs will need to be serviced every 500 running hours. A typical service will consist of changing filters and oil. A spill kit will be used to ensure that any spillage is contained.
- **Drainage inspection** - The local drainage around the compound and the silt fence on the downslope side of the compound will be checked once per week to ensure adequate function and that there are no signs of blockage.

5.4 Pipeline Route

The entire pipeline route will be visually inspected every day by driving the route to identify any signs of damage or distress to the pipeline and to ensure all stock proof fencing remains intact.

The Cross River outfall will be inspected once per day. The purpose of the inspection will be to ensure that the diffuser is working properly and is not blocked, to ensure the rock armour and geotextile has not become dislodged or unstable. The pumps will be shut down immediately in the unlikely event that there is a concern with regard to the integrity of the outfall.

5.5 Environmental Management and Monitoring

5.5.1 Water Quality Monitoring

A specialist contractor will be appointed by RCC to carry out monthly water quality sampling of the Lough Funshinagh and the Cross River.

A water quality monitoring programme is planned for both Lough Funshinagh and the Cross River for the duration of the interim scheme.

5.5.2 Refuelling

Refuelling will take place at the intake compound with the truck parked over a portable PVC containment bund mat. This is designed for use under vehicles and shall act as a containment system to catch any spills which may occur during refuelling. The mat is manufactured from 900gsm PVC-coated hydrocarbon and shall be placed on top of a geotextile layer.

The following measures will be in place during refuelling operations to mitigate the risk of accidental spills:

- Refuelling shall take place with the vehicle parked over a portable PVC containment bund mat. This is designed for use under vehicles and shall act as a containment system to catch any spills which may occur during refuelling. The mat is manufactured from 900 grams per square metre (gsm) PVC-coated hydrocarbon and shall be placed on top of a geotextile layer
- Only designated trained and competent operatives will be authorised carry out refuelling operations
- Spill kits will be kept on site in case of accidental spillages and all designated operatives will be trained in using them
- Fuel tanks will only be filled from transportation tankers under the use of automatic shut off overfill protection
- The fuel tanks shall not be left unattended during refuelling
- Oil booms will be kept on site to deal with any accidental spillage
- Strict procedures for fuel tank and plant inspection, maintenance and repairs shall be detailed in the contractor's method statements and construction machinery shall be checked for leaks before arrival on site
- The plant refuelling procedures described above shall be detailed in the contractor's method statements.

5.5.3 Spill Management

A spill kit will be available at the intake compound in case of leaks and spills. All operational staff will be trained on how to use spill kits. In the event of a spill incident, immediate action will be taken to identify and stop the source of the spill.

The appointed operations contractor will be immediately given information on the location, type, and extent of the spill so that they can take appropriate action. If possible, efforts will be made to clean up as much as possible using the spill control materials. The disposal of any used spill control material will be done using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.

5.5.4 Waste Arising

Waste may be generated during the operation of the proposed scheme as a result of the screens being cleared and the maintenance of the hydraulic pumping units (old filters, used hydraulic filters etc.). The provision of appropriate waste management at each working area and regular collections as per the existing arrangements on site.

5.6 Health and Safety

All operational staff will progress their works with reasonable skill, care and diligence and, at all times, proactively manage the works in a manner most likely to ensure the safety, health and welfare of those carrying out operational works, pedestrians, road users and other interacting stakeholders.

A set of standardised emergency response procedures will govern the management of emergency incidents such as spill management, pipeline leaks, flooding and fire.

An emergency contact list will be established and made available to all operational staff employed. The contact list will include key RCC and other personnel that may need to be contacted in the event of an incident.

6. Decommissioning

6.1 Pump Intake System

Decommissioning of the pump intake system will involve the following:

- The pumps will be shut down and disconnected from the pipeline and hydraulic hoses.
- A 60-tonne mobile crane will be used to lift the pump pontoon (with the pumps inside) from the lough to an articulated truck parked in the intake compound. A small boat will be in the water to assist.
- The floating access pontoons will be dismantled (unbolted) and lifted from the edge of the lough to a truck parked in compound using the 60-tonne crane.
- The same crane will lift the HPUs and fuel tanks onto the truck.

6.2 Intake Compound

Decommissioning of the intake compound will involve the following sequence:

- The stock proof fence and paladin fence will be taken up and loaded onto a flatbed truck for reuse
- The concrete HPU bund will be demolished using an excavator with a rock breaker and removed to a licensed facility
- The Class 6F stone (compound) as well as the geogrid / geotextile used to construct the compound will be taken up and brought to a licensed facility. A reuse for the stone aggregate will be sought where possible following confirmation of acceptability
- The ground beneath the footprint of the compound will be rotovated and tilled to reinstate the area to agricultural usage, similar to the surrounding lands.

6.3 Pipeline Route

Decommissioning of the pipeline will involve complete removal of all rigid PE pipe and flexible ‘layflat’ pipe.

6.3.1 Road Crossing

Decommissioning of the road crossings will involve the following sequence:

- The HDPE carrier pipes will remain in place after the pipeline has been removed
- Each end of the pipe will be blocked by filling in the trench at the ends. The redundant pipe beneath the road will not be of concern
- The existing hedgerow which was removed will be replanted using native hedge species and/ or walls/ fences will be restored.

6.4 Outfall

Decommissioning of the outfall will involve the following sequence:

- The PE ribbed pipe and diffuser tee will have been removed in conjunction with the remainder of the pipeline
- The rock armour and natural flag stones will be carefully removed from the surface of the geotextile using an excavator and placed into a tipper truck or tracked dumper
- The geotextile will be pulled across the river and removed by hand without entering the water.

6.5 Waste Arising

All waste arising will be managed in accordance with the waste hierarchy, in compliance with the provisions of the Waste Management Act, 1996, as amended, and to contribute to achieving the objectives set out in the Waste Action Plan for a Circular Economy (DECC, 2020).

Opportunities for reuse of materials, by-products and wastes will be sought throughout the decommissioning phase. Where possible, metal, timber, glass and other recyclable material will be segregated and removed off site to a permitted / licensed facility for recycling.

The contractor appointed for the decommissioning of the scheme will record the quantity in tonnes and types of waste and materials leaving the site. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show the type of material, specifying those that are recovered, recycled, and disposed of. The relevant appropriate waste authorisation will be in place for all facilities that wastes are delivered to (i.e., EPA Licence, Waste Facility Permit or Certificate of Registration).

The following are the expected wastes to be generated during the decommissioning phase:

- Concrete from HPU bund and Paladin post bases to be removed to a licensed facility
- Geotextiles/ geogrid to be taken to licensed facility and reused following confirmation of acceptability
- Stone aggregate to be taken to licensed facility and reused following confirmation of acceptability
- Fencing (posts, wire and paladin) to be gather for re-use
- Rock amour to be taken to licensed facility
- Pipeline to be gather and re-used where possible.

6.6 Nature of any Associated Demolition Works

No demolition works are associated with the proposed scheme. Limited ground works and excavations are required (restricted to the road crossings).

7. Baseline Environment and Likely Significant Effects

This section refers to the following reports which are submitted as part of the statutory approval application to An Bord Pleanála:

- Arup (2024) Construction Environmental Management Plan for Lough Funshinagh Interim Flood Relief Scheme (referred to as the CEMP)
- Arup (2024) Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) Report for Lough Funshinagh Interim Flood Relief Scheme
- Arup (2024) Ecological Impact Assessment Report for Lough Funshinagh Interim Flood Relief Scheme (referred to as the EcIA Report)
- Arup (2024) Architectural Impact Assessment for Lough Funshinagh Interim Flood Relief Scheme (referred to as the AIA); and
- Arup (2024) Water Framework Directive Assessment Report for Lough Funshinagh Interim Flood Relief Scheme (referred to as the WFD Assessment).

7.1 Population and Human Health (including Traffic)

7.1.1 Existing Environment

Lough Funshinagh is located in County Roscommon. The Central Statistics Office (CSO) reported that in 2022 Roscommon County had a population of 70,259 persons (35,089 females and 35,170 males). Results from the 2022 Census reported that there was a population increase of 8.8% between April 2016 and April 2022 whereby the number of people in the county rose by 5,715.

The closest large settlement to the lough is Athlone town which is approximately 13 km to the southeast with a population of 22,869 people reported in 2022 by the Central Statistics Office (CSO).

The proposed scheme will reduce the risk of flooding from Lough Funshinagh to surrounding residential houses, road infrastructure, businesses (including farms) and agricultural lands on an interim basis. Residents living in flood prone areas are likely to experience an increased psychological burden such as heightened anxiety during heavy rain or storm events, in addition to their traumatic experience of the actual effects of flood events.

7.1.2 Construction

During the construction stage, there will be some temporary disruption experienced by nearby residents, road users and pedestrians in the immediate vicinity of the works however, these disruptions are predicted to be localised, temporary (up to one month) and are not predicted to have significant effects on the population or human health.

There will be temporary disruption to local road users for two public roads (L2013, R362) and one private access road due to necessary road crossings for the proposed pipeline, which will be done by open cut trenching. On public roads, one lane of traffic will be maintained for the duration of these works to maintain traffic flow. Temporary barriers and suitable signage will be used to restrict access and to provide safety measures for workers.

Standard construction methods and materials will be used and will not be harmful to human health nor the environment. The contractor will ensure that the proposed works are carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). The type of construction works proposed are not complex in nature and are well understood therefore, the risk of accidents and /or risks to human health, having regard to substances or technologies used is very low.

Given the nature, scale and duration of proposed construction works no significant effects associated with nuisance emissions such as dust, noise or odour are predicted on the local population or nearby residences.

Nuisance emissions such as noise (from construction traffic, plant or activities) and dust are considered further in Sections 7.5 Noise and Vibration, and 7.6 Air Quality.

Careful and considered local consultation will be carried out with nearby residences to ensure that the minimum amount of disturbance will be caused.

7.1.3 On-Site Operations

During operations, a diesel tanker will deliver fuel for the HPUs (at the intake compound) typically every fourth day. The operational phase of the proposed scheme is not predicted to give rise to any perceptible increase in traffic on the local road network.

The HPUs will generate noise emissions at the compound. This is considered in further detail in Section 7.5 Noise and Vibration, below.

All roads and farmland will be reinstated upon completion of works and there will be no significant activities carried out during the operational phase other than routine maintenance and inspection. No significant effects on population and human health are predicted during the operational phase.

7.1.4 Decommissioning

The effects on human health and traffic are expected to be similar to those experienced during construction and therefore no significant effects are expected during this phase. The decommissioning works will be in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) and local consultation will be undertaken to ensure minimal disruption to nearby residents.

7.1.5 Conclusion

Considering the scale and nature of the proposed scheme, no significant effects on population, human health and traffic are predicted during the construction, operational or decommissioning phases.

7.2 Biodiversity

7.2.1 Existing Environment

Lough Funshinagh itself is a Special Area of Conservation (SAC), designated for the Annex I habitats of Turloughs and *Chenopodion rubri* habitat. The site is in proximity to a number of other international designated sites, including Lough Ree SAC, River Shannon Callows SAC, Ballynamona bog and Corkip Lough SAC, Monagan Bog SPA, Lower River Shannon SAC, Lough Ree Special Protection Area (SPA), River Suck Callows SPA, Four Roads Turlough SPA, Lough Croan Turlough SPA, and Middle Shannon Callows SPA. In addition, a National Heritage Area (NHA) - Carrickynaghtan Bog – is located approximately 200m south of the River Cross.

The Appropriate Assessment report identified potential for impacts on Lough Funshinagh SAC, Lough Ree SAC, River Shannon Callows SAC, and Lower River Shannon SAC.

The pipeline route from Lough Funshinagh to the River Cross crosses agricultural grassland and runs through a number of hedgerows. The River Cross at the pipeline discharge point is a deeply canalised agricultural watercourse which becomes shallower as it travels downstream to the River Shannon approximately 20km to the southeast. The Cross River discharges to the River Shannon at the Shannon Callows SAC.

Desk study review of the area of the proposed scheme identified predominant habitats within the scheme boundary to include improved grassland, lakes and ponds, wet grassland, and hedgerows.

Species and habitat surveys within the area of the proposed scheme to inform the baseline are summarised below (see Table 2 below).

Table 2 Summary of ecological surveys

Survey Type	Dates of Survey	Survey Locations
Multi-disciplinary Walkover Survey; Habitat survey Otter survey Badger survey	28th March 2024, 5th, 25th June 2024 4th, 11th, 18th, 25th July 2024	Lough Funshinagh
Riparian and terrestrial habitat survey	2nd, 5th to 9th August 2024	Cross River
Hedgerow and preliminary roost feature (PRF) survey	28th March 2024 25th June 2024 9th August 2024	South end of Lough Funshinagh following fields to the Cross River outfall
Trail Cameras in operation	March to August 2024	Lough Funshinagh and Cross River
Wintering bird surveys	November 2023 – March 2024	Lough Funshinagh and adjacent smaller lakes
Breeding bird surveys	April – June 2024	Lough Funshinagh and adjacent smaller lakes
Aquatic surveys	10th August 2024	Seven sites along the Cross River

Lough Funshinagh Baseline

Lough Funshinagh, and surrounding small lakes and wetlands, support a wide range of wintering and breeding bird species, including qualifying interest of nearby SPAs. Otter was recorded at Lough Funshinagh by a trail camera located at the south end of the turlough in shallow waters, approximately 400m east of the proposed scheme. Two badger setts were identified surrounding Lough Funshinagh, one at the southern end and the other at the northwestern end, and generally high levels of badger activity were noted in proximity to the lough. No bat activity surveys were carried out, however given the availability of mature trees, old stone buildings, dead trees, abundance of insects, and observations of bats during Breeding Bird Surveys, it is considered highly likely that bat roosts are present surrounding Lough Funshinagh. In addition, pine martin (*Martes martes*) was recorded in the form of trail camera evidence. One aquatic Invasive-Non-Native Species (INNS), Canadian pondweed (*Elodea canadensis*) was recorded within Lough Funshinagh. Mink was recorded on the edge of the lough on trail cameras.

Lough Funshinagh to Cross River Baseline

During the walkover surveys of the Cross River and its surrounding lands in 2024, several bird species were observed, however there were no observations made of species which correspond as qualifying interest of nearby SPA sites. Otter spraints were identified in a number of locations on the Cross River; however, no holts or couches were identified. Brook lamprey (*Lampetra planeri*) ammocoetes were recorded at the proposed location for discharge to the Cross River and eDNA analysis showed presence of brook lamprey likely throughout the Cross River. Brown trout (*Salmo Trutta*) were also identified in downstream sample sites on the Cross River and are known to access the upper reaches of the Cross River in higher flows. eDNA analysis also identified white-clawed crayfish in the lower reaches of the Cross River, however the lack of evidence during targeted surveys in recent years means that any population in the Cross River is likely to be highly fragmented.

7.2.2 Construction

The following potential impacts on habitats/species may occur during construction:

- Aquatic and terrestrial habitat loss to facilitate the intake compound, overland pipe laying and access to the River Cross (including SAC qualifying interest features and hedgerow);
- Introduction and/or spread of Invasive Non-Native Species (INNS);
- Disturbance of species, including disturbance to foraging, commuting and breeding;
- Mortality/injury of species;
- Habitat degradation due to movement of vehicles, accidental pollution events, changes to hydrology, changes to water quality, temporary overland flooding in the scenario of damaged pipe.

Terrestrial habitat loss will be minor and temporary, with removal of hedgerow limited to 5 m width on field boundaries and on the side of roads, and native hedgerow will be replanted in these areas following cessation of the works. Positioning of the overland pipes will be micro-sited to avoid sensitive ecological features, including mature trees. Embedded mitigation measures to be implemented include:

- Implementation of all guidance outlined in Section 7.3 of the EcIA Report, as outlined within the CEMP;
- Strict biosecurity measures will be required to be put in place. Measures will be required to specify no transfer of plant materials without appropriate safeguards to avoid the introduction and/or spread of invasive non-native species to the site;
- Any areas of exposed sediment deemed at risk of erosion during heavy rainfall shall be protected using measures such as coir matting until vegetation is able to establish on these surfaces. The Ecological Clerk of Works (ECoW) will identify locations likely to be at risk of erosion;
- The flow in the Cross River will be monitored at three locations by OPW hydrometric gauges at 15-minute intervals for the duration of the interim scheme. Two new hydrometric gauges will be installed on the left bank of the Cross River. The pumping control system will be remotely monitored and if required the pumping flow rates will be adjusted or shut off.
- Weekly water quality testing will be undertaken at seven locations on the Cross River and three locations in Lough Funshinagh;
- Standard measures to prevent soil and water pollution through CEMP in construction stage;
- Appointment of Ecological Clerk of Works (ECoW) to implement mitigation measures during construction and decommissioning;
- Silt fences during construction, with specification to be reviewed by a qualified surface water specialist on behalf of RCC, and installation to be reviewed by ECoW;
- Access by machinery to avoid stretches of any watercourse adjacent to the pumping site;
- No excavation works during/following heavy rainfall;
- Construction adhere to industry best practice guidelines, as outlined in Section 7.3 of the EcIA Report;
- Application of standard mitigation measures for construction related contaminants (refuelling, maintenance, storage, pouring of concrete etc.); and
- Proposed HPU bund to support the HPUs and fuel tanks. A sump will be provided to enable rainwater to be pumped out at regular intervals, and upstand walls also serve as a wheel stop to prevent vehicles accidentally impacting fuel tanks during turning manoeuvres.

Measures including provision of a Construction Environmental Management Plan (CEMP) and adherence to CIRIA Good Practice will be implemented throughout the construction phase by the appointed contractor which include pollution prevention control measures to control surface water runoff, to avoid habitat degradation, in particular of aquatic habitats. The CEMP will also include measures to prevent the spread of INNS. The geotextile layer and natural flag stones to cover the riverbed will prevent erosion to the river habitat.

Mortality/injury of species will be avoided through provision of an Ecological Clerk of Works (ECoW) to supervise hedgerow clearance during the breeding bird season and where badger may be present, covering of open excavations at night. At the outfall location, brook lamprey will be translocated to a suitable site upstream to prevent adverse impact, including disturbance, mortality, and injury. Any instream working will be supervised by an ECoW with a freshwater ecology and fisheries specialism and experience of overseeing construction activities in or around water.

It is not anticipated to be any significant increase in disturbance during operation. Inspection of the outfall will be non-intrusive, and the outfall has been designed to dissipate energy from water discharging from the outfall pipe such that input of water from the outfall is not considered a likely significant source of disturbance. Weekly water quality testing will also be undertaken at several locations utilising standard measures to prevent water pollution during construction which are outlined within the CEMP.

Mitigation to prevent disturbance/displacement of species will include provision of an ECoW to undertake a walkover of the turlough edge in proximity to works each day during the construction period to identify if otters are present. The ECoW will inform site personnel when works can commence without causing disturbance to otter.

Construction works will be undertaken during the daytime, such that disturbance impacts are unlikely to be significant. Artificial lighting will be limited to the mornings and evenings in winter, when natural light levels are low. Lighting will be designed to avoid illuminating habitats suitable for bat and badger.

To avoid fragmentation of badger territories, ramps will be placed over the pipes, and pipes of 30cm diameter placed through the stock proof fence, at a maximum of 100m intervals where in close proximity to the identified badger setts. The pipes and ramp will be positioned wherever the pipeline crosses a field boundary across the entirety of the pipeline route, with a maximum of 500 m between access routes. This will mean the maximum distance a badger will be displaced to travel through the pipeline barrier in any area of the pipeline would be 500 m. This distance is not considered significant enough to cause a likely significant impact on the survival and reproductive success of badgers in the area.

To protect brook lamprey during construction activities, it is advised to schedule in-stream work outside the spawning and early larval development periods. Therefore, in-stream work should be avoided during the spawning period (March to May) to prevent disturbance of spawning adults and the disturbance of spawning beds where eggs are deposited. In addition, in-stream construction works should be avoided during the salmonid close season (October to June inclusive) to protect downstream spawning salmonids from potential water quality (e.g. sedimentation risks). This period will also protect the early part of the lamprey larval development stage (i.e. June) as early developmental ammocoetes are vulnerable to sedimentation and habitat disruption). If works are to be undertaken during the above avoidance periods, given the nature of the proposed scheme and the urgency in relation to current water levels in Lough Funshinagh, a derogation will be sought.

7.2.3 On-Site Operations

During the operational phase, the following potential impacts to habitats/species may occur:

- Disturbance of species, including disturbance to foraging, commuting and breeding;
- Introduction/spread of INNS;
- Aquatic and terrestrial habitat degradation due to water quality impacts, accidental pollution events; and,
- Habitat fragmentation.

A Project Ecologist will be appointed implement mitigation measures during operations. This can be the same person as the ECoW.

Weekly water quality testing will be undertaken at several locations including pumping location at Lough Funshinagh, discharge point at entry to Cross River, confluence of Cross River and Brideswell, and the discharge point to the River Shannon throughout operation of the pumps to ensure water quality within the River Cross is not degraded due to inputs from Lough Funshinagh. Disturbance to species during operation will be minor and temporary, limited to maintenance and monitoring of the pumps, pipeline route, and outfall location.

Remotely accessed trail camera(s) shall be installed in proximity to the pump intake compound to monitor for any otters present during operation. These shall be checked 2-3 times a week for otter presence. If any evidence of otter is identified this will be reviewed and any necessary further measures to mitigate effects identified and implemented.

If obvious sudden avoidance by otter of the pump intake compound is occurring then the Project Ecologist will review behaviour, consider whether this is significant and discuss as necessary with relevant NPWS staff as to whether revised pumping hours may be required.

Controls will be put in place to allow the pumping to be reduced or stopped if adverse effects are identified at flow gauges or as a result of water chemistry testing. As such, water quality impacts on the Cross River, downstream designated sites, and aquatic species, such as white clawed crayfish, will be mitigated.

A 10mm aperture fish screen with a net area of $2m^2$ through which water will enter the container within the lough will prevent fish and invasive macrophytes being sucked into the container. The approach velocity will be a maximum of 150mm/second at a flow rate of 300 litres/second, at which it is anticipated juvenile fish can swim away from the pumps and avoid getting entrained on the mesh.

A repeat badger survey will be carried out after the first year of operation to confirm whether any new setts have been established, and to ascertain whether there are any signs of digging under the fence, such that the position of the badger pipes and ramps can be reviewed.

All effects are considered to be temporary and reversible.

7.2.4 Decommissioning

All effects during the decommissioning phase are anticipated to be temporary and reversible, and similar to those during the construction phase.

The potential effects of decommissioning activities on important ecological features include:

- Introduction and/or spread of INNS;
- Temporary disturbance;
- Habitat degradation (due to reduction in water pressure within Cross River and disturbance of sediment within Lough Funshinagh, accidental pollution events, spread of INNS);
- Mortality/injury of species.

Implementation of mitigation, as for the construction phase, is anticipated to avoid significant impacts on habitats/species during decommissioning.

7.2.5 Conclusion

In the absence of mitigation, there is potential for significant impacts on designated sites, habitats, and species as a result of the proposed scheme. However, with the implementation of measures as outlined above, significant effects as a result of the proposed scheme will be avoided, and there will be no significant effects on biodiversity as a result of the proposed scheme.

7.3 Land, Soils, Geology and Hydrogeology

7.3.1 Existing Environment

Landscape and geomorphology: The proposed scheme includes an intake compound site located at an elevation of 70m OD. From here, an overland pipeline will be laid along a pipeline route which is relatively flat following a topographical low towards Curraghboy and then discharging into the Cross River at an elevation at 70mOD. Tailte Éireann Land Cover Mapping[3] indicates the proposed scheme traverses improved grassland sites in a rural environment.

[3] Tailte Éireann (2024) National Land Cover Maps, available: National Land Cover Map - Tailte Éireann

Soils and subsoils: The Teagasc soils map[4] indicates that much of the pipeline route extends over grey brown podzolics with pockets of other soil types in the vicinity of the pipeline route including surface and groundwater gleys and lithosols. The subsoil comprises primarily of till derived chiefly from limestone with an area of peat to the west of the route at Carrick. A linear feature of esker sands and gravels is evident north of Curraghboy. Alluvium is present along the Cross River channel.

Bedrock geology: The underlying bedrock geology was determined based on the 1:100,000 GSI online mapping[3]. The bedrock geology maps show that the study area is underlain by Visean Limestones (undifferentiated).

Hydrogeology: The Visean Limestones underlying the study area are categorised by the GSI as part of the Dinantian Pure Bedded Limestones hydro-stratigraphic rock unit group. This extends across much of south County Roscommon from the River Suck on the western county boundary to Lough Ree in the east. The Dinantian Pure Bedded Limestones are a Regionally Important karstified bedrock aquifer dominated by conduit flow (Rkc). GSI Groundwater Vulnerability maps indicate the vulnerability varies from Medium to Extreme along the proposed scheme[3]. The regional groundwater flow direction is considered to be towards Lough Ree, however there is currently no groundwater monitoring available in the area and this is based on the main hydrogeological and hydrological features. Local variations in the groundwater flow direction exist due to karstified nature of the bedrock. Groundwater gradients are relatively low across the region and may not reflect the topography. Furthermore, due to the karstified nature of the bedrock the groundwater catchment boundaries may not reflect the surface water catchment boundaries.

Designated sites: Lough Funshinagh is a County Geological Site, SAC and pNHA. Approximately 20 km downstream of the pipeline outfall location, the Cross River enters the River Shallon Callows SAC and Middle Shannon Callows SPA.

Possible sources of contamination and unsuitable material: There are no historical developments within the proposed scheme indicative of contamination sources. There are no licensed facilities within the proposed scheme.

Economic Geology: The proposed scheme is located within an area of moderate crushed rock aggregate potential.

7.3.2 Construction

The construction phase of the proposed scheme will involve a section of the topsoil underneath the PE ribbed pipe (approximately c. 320m) near the outfall being rotovated due to the existing uneven surface from cattle tracks which could impede the gravity flow. There will be a negligible amount of excavation of soils for the trenches at the road crossings and this will be reused to backfill the trench where possible and therefore there is no likely significant impact on soil or aggregate resources from the proposed scheme during the construction phase. The pipes will not cause any significant settlement on the ground and any settlement that does occur will be short term and will not likely exceed 50 mm[5].

During construction, there is a potential for accidental spillages associated with site activities which have the potential to enter the soil and groundwater. Appropriate mitigation measures outlined in the CEMP will be implemented to limit the potential for such spills and accidents.

7.3.3 On-Site Operations

During operations, a diesel tanker will deliver fuel to the fuel tanks in the intake compound typically every fourth day. A concrete bund within the compound is provided to contain any spills and any spills will be managed with spill kits. Refuelling shall take place with the vehicle parked over a portable PVC containment bund mat. Potential contamination of soil and groundwater from diesel tank spillage during operations (e.g. refuelling) is not considered likely to result in significant impacts given the straightforward nature of the activities and proposed containment measures outlined in Section 5.5.2.

[4] GSI (2024) Geological Survey Ireland Spatial Resources, available: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228 [accessed August 2024]

[5] MWP, September 2024, Lough Funshinagh Interim Flood Management Measures – Engineering Report [Issue]

The operating phase involves controlled pumping of surface water from Lough Funshinagh to the Cross River. The pumping may influence the groundwater levels around and underlying Lough Funshinagh. However, the pumping will not lower the lough level, and by extension the groundwater level, below its normal range of fluctuation. On this basis there are no likely significant impacts on groundwater levels and flow.

During the operational phase, a maximum flow of 300 l/s of water will be discharged to the Cross River which flows downstream to join the River Shannon Callows SAC and Middle Shannon Callows SPA. The hydraulic modelling along the Cross River suggests the flooding of the Shannon Callows is driven by the River Shannon and not the Cross River[5]. As there will be no significant change to the river levels and flooding regime of the Cross River in the Shannon Callows area, there is not expected to be any discernible change in the groundwater levels in this area or any associated impact on the groundwater dependant terrestrial ecosystems.

7.3.4 Decommissioning

During decommissioning works the intake compound will be removed and the underlying ground reinstated to agricultural use. No excavation works are anticipated during the decommissioning phase. The geotextile, natural flag stones and rock armour will be removed from the outfall. The overland pipe will also be removed. No significant effects are predicted to land, soils, geology and hydrogeology.

7.3.5 Conclusion

Considering the scale and nature of the proposed scheme, no signification effects to land, soils, geology and hydrogeology are predicted during the construction, operational and decommissioning phases.

7.4 Water

7.4.1 Existing Environment

Lough Funshinagh is located within the 42.7km^2 Cross (Roscommon)_010 (**IE_SH_26C100060**) WFD river waterbody of the Upper Shannon Catchment (26G). The Upper Shannon Catchment is 383km^2 and covers an area from Athlone to Shannonbridge. The catchment is characterised by flat topography underlain by karst features and poorly draining soils. Groundwater within the Funshinagh WFD groundwater body (**IE_SH_G_091**) is closely connected to surface water in the headwaters where Lough Funshinagh is located. Lough Funshinagh is located north of Curraghboy in a karstified part of the catchment. Although there is no surface outflow channel, underground flow has been identified through dye tracing, discharging to the Cross River near Brideswell.

The Cross River originates from groundwater springs about 2.8km south of Lough Funshinagh and flows for 20km before joining the River Shannon. The River Shannon drains from Lough Ree into 26G through Athlone, before being joined by the Cross River from the west. Continuing south, the Shannon is then joined from the east by the Cloonbonny and Boor Rivers, before being joined from the west by a series of small tributaries, the largest of which is the Ballydangan River. The Shannon flows out of the catchment at Shannonbridge.

Hydrologically connected protected areas are as follows:

- IE_SH_G_091 designated for drinking water
- IERI_SH_2010_0002 designated as nutrient sensitive waters
- Protected areas:
  - IE0000611 The Lough Funshinagh SAC
  - IE0002337 Crosswood Bog SAC
  - IE0004096 The Middle Shannon Callows SPA
  - IE0000216 River Shannon Callows SAC

- IE0004077 River Shannon and River Fergus Estuaries SPA
- IE0004058 Lough Derg (Shannon) SPA
- IE0002241 Lough Derg, North-east Shore SAC
- IE0002165 Lower River Shannon SAC.

All the WFD river waterbodies connected to the Cross River are 'at risk' of not reaching their goal of 'good' status by 2021 or earlier. The most recent WFD cycle (2016-2021) indicated that all the WFD river waterbodies have a 'moderate' status. Current pressures on surface water bodies are mainly through morphological change to hydromorphology and nutrient inputs through agriculture. The EPA biological river quality monitoring along the Cross River indicates that there is strong groundwater influence in the upper reaches, resulting in typically low dissolved oxygen saturation for a river. Although there were improvements to good quality in the middle reaches a decline was reached at the discharge to the River Shannon.

The connected WFD groundwater body is 'not at risk' and is in a 'good' status.

7.4.2 Construction

During construction, there is a potential for accidental spillages associated with the site activities which have the potential to enter the surface and groundwater.

Measures including the provision of a Construction Environmental Management Plan (CEMP) and adherence to CIRIA Good Practice will be implemented throughout the construction and decommissioning phases by the appointed contractor which include pollution prevention control measures to control surface water runoff and to avoid habitat degradation, in particular of aquatic habitats. The geotextile layer to cover the riverbed will prevent erosion to the river habitat.

7.4.3 On-Site Operations

During operations, a diesel tanker will deliver fuel to the intake compound fuel tanks typically every fourth day. Potential contamination of surface and groundwater from diesel tank spillage during operations is not predicted to result in any significant impacts. A concrete bund within the compound will contain any spills and any spills will be managed with spill kits and refuelling shall take place with the vehicle parked over a portable PVC containment bund mat.

The operating phase involves controlled pumping of surface water from Lough Funshinagh to the Cross River. Refer to Section 7.3 for impacts to the groundwater regime of Lough Funshinagh SAC.

During the operational phase, a maximum of 300 l/s of water will be discharged to the Cross River. Discharge of water to the river will potentially impact the quality elements of the WFD river waterbody through a change in hydrological regime, short-term creation of a barrier to movement at the discharge point, temporary habitat loss and fragmentation, degradation of habitats, introduction of nutrients and sediments, change in temperature and dissolved oxygen, disturbance of fauna and potential spread of non-native invasive species. A Waste Assimilative Capacity Assessment undertaken in the WFD Report for the proposed scheme indicates that the Cross River has capacity to assimilate the water from the lough, without significant impact on water quality. A high flow analysis[5] undertaken for the proposed scheme indicates that there will be limited change to water levels at the confluence of the River Shannon with the proposed pumped flow. A low flow analysis[5] undertaken for the proposed scheme indicates that flow is likely to almost double in the Cross River, but a streamflow analysis indicated that flow is below the erosive threshold.

Mitigation for the WFD waterbody elements will be as follows:

- Rock armour, natural flag stones and geotextile at the proposed outfall location to reduce risk of erosion
- Allowance for fish passage at the proposed outfall location; and
- Monitoring programme for water level, hydromorphology and water quality.

Weekly water quality testing will be undertaken at seven locations throughout operation of the pumps to ensure water quality within the River Cross is not degraded due to inputs from Lough Funshinagh. Disturbance to species during operation will be minor and short-term, limited to maintenance and monitoring of the pumps, the pipeline route, and the outfall location.

Controls will be put in place to allow the pumping to be reduced or stopped if adverse effects are identified at flow gauges or as a result of water chemistry testing.

A 10mm aperture fish screen with a net area of 2 m^2 through which water will enter the container within the lough will prevent fish being sucked into the pumps. The approach velocity will be a maximum of 150 mm/second at a flow rate of 300 litres/second, at which it is anticipated juvenile fish can swim away from the pumps and avoid getting entrained on the mesh.

All effects are therefore considered to be short-term and reversible.

7.4.4 Decommissioning

All effects during the decommissioning phase are anticipated to be temporary and reversible.

The potential effects of decommissioning activities on important ecological features include:

- Habitat degradation (due to reduction in water pressure within the Cross River and disturbance of sediment within Lough Funshinagh, accidental pollution events)
- Implementation of mitigation, as for the construction phase, is anticipated to avoid significant impacts on habitats/species during decommissioning.

Conclusion

In the absence of mitigation, there is potential for significant impacts on water quality and quantity, and hydrologically connected protected areas as a result of the proposed scheme. However, with the implementation of measures as outlined above, significant effects as a result of the proposed scheme will be avoided, and there will be no significant effects on water quality and quantity as a result of the proposed scheme during the construction, operational and decommissioning phases.

7.5 Noise and Vibration

7.5.1 Existing Environment

A noise survey has been undertaken in Summer 2024 to determine the existing noise environment in the vicinity of the proposed scheme. The existing environment in this location is relatively quiet, being rural farmland and over 1.5 km from the closest settlement of Curraghboy. The acoustic environment, as noted during the baseline noise survey, is primarily influenced by wind in trees, distant traffic from the R362 (over 1km away), intermittent airplanes, dogs barking, bird song, ducks and geese, lapping of water at the lough, distant gardening machinery, and livestock.

7.5.2 Nearby Sensitive Receptors

The proposed scheme is located in a rural area with a few scattered nearby sensitive receptors. The nearest sensitive receptors to the proposed scheme are:

- Residential dwelling located approximately 35 m west of the intake compound
- Residential dwelling located approximately 450 m south of the intake compound
- Residential dwelling approximately 800 m south of the intake compound; and
- Residential receptors located near to the road crossings approximately 1.25 km and 1.7 km southwest of the intake compound.

7.5.3 Potential Impacts

The main potential noise and vibration impacts associated with the proposed scheme will be:

- Construction Phase:
  - Works associated with the development of the site; and
  - Construction traffic to and from the site.
- Operational Phase:
  - Increased traffic as a result of the proposed scheme in the form of diesel delivery trucks; and
  - Operation of the 2 x 600kW diesel-hydraulic power packs that will power the 2 no. submerged pumps.
- Decommissioning Phase:
  - Works associated with the decommissioning of the pump intake system, intake compound, pipeline and outfall to the Cross River.

7.5.3.1 Construction Phase

Noise will be generated during the construction of the interim scheme due to construction traffic, construction machinery, excavation works etc. The effect of construction noise on sensitive receptors in the immediate vicinity of the site will be temporary due to the limited duration of construction works. The construction and installation is expected to take up to one month. Construction hours will be limited to 07:00-19:00 Monday to Friday and 07:00-16:00 on Saturdays. No significant night-time works or works on Sundays or bank holidays are expected. Construction works have the potential to cause temporary adverse impacts on nearby sensitive receptors. The effects are not expected to be significant due to their temporary nature.

Noise emissions will be controlled by the implementation of best practice construction methods. Examples of measures to be employed include noise barriers, the selection of quiet plant, not leaving plant idling, and maintenance of plant to minimise noise generation.

The main source of vibration during the construction phase will be excavation during the proposed road crossing works. As excavation works will occur at distances greater than 65 m from any sensitive receptor, it is not predicted that there will be any adverse vibration effects.

Due to the implementation of mitigation measures and the limited duration of the works, it is not predicted that there will be any significant adverse noise or vibration impacts associated with the construction phase.

7.5.3.2 Operational Phase

During the operational phase, the main aspects of the proposed scheme likely to generate noise are as follows:

- Operation of the proposed 2 no. 600kW diesel-hydraulic power packs
- Increased traffic due to the fuel tanks requiring refilling every 4 days.

These aspects have the potential to adversely impact the nearby noise sensitive receptors due to the low background noise levels in the area.

The operational phase of the proposed scheme is expected to be in place for up to 2 years.

A 3D noise model has been created in the acoustic modelling software SoundPLAN 8.2 to assess the potential impact on nearby noise sensitive receptors.

The design of the intake compound includes the following embedded mitigation, which has been included in the noise model:

- A 4m high solid noise barrier completely surrounding the hydraulic power packs, with an acoustically absorptive material facing the power packs.

Note that completely enclosing the hydraulic power packs is not possible because of the operational ventilation and cooling requirements of the pumps.

Predicted noise levels following the implementation of mitigation show that there is the potential for significant adverse noise impacts to the closest noise sensitive receptor due to the proximity of the receptor (35m from intake compound) and the low background noise levels in the area. The predicted impacts on all other noise sensitive receptors are not predicted to be significant due to the distance between the proposed scheme measures and these sensitive receptors.

Given the interim nature of the proposed scheme (up to 2 years) and in order to further mitigate the potential impact of noise to the closest sensitive receptor, alternative accommodation will be offered to the residents by Roscommon County Council, should it be required, for the duration of the proposed scheme.

Following the implementation of the mitigation measures proposed, there are not expected to be any significant noise impacts to nearby sensitive receptors.

There are no significant sources of vibration associated with the operational phase, and therefore no significant impacts associated with vibration for the operational phase of the proposed scheme.

7.5.3.3 Decommissioning Phase

During the decommissioning phase, the main aspects of the proposed scheme likely to generate noise are as follows:

- Decommissioning of the pump intake system, pipeline and outfall to the Cross River; and
- Decommissioning of the intake compound.

The decommissioning phase has the potential to cause temporary adverse impacts on nearby noise sensitive receptors. Noise emissions will be controlled by the implementation of best construction practice. Examples of measures to be employed include noise barriers, the selection of quiet plant, not leaving plant idling, and maintenance of plant to minimise noise generation.

With the implementation of mitigation measures and the limited duration of the works (similar to the construction phase), it is not expected that there will be any significant adverse noise impacts associated with the decommissioning phase.

The main source of vibration during the decommissioning phase will be the demolition of the concrete bund, where excavators and rock breakers are likely to be used.

Due to the distance of the sensitive receptors from the site, it is not expected that the decommissioning phase will produce any significant vibration impacts.

7.5.4 Conclusion

It is not predicted that there will be any significant noise or vibration impacts as a result of the proposed scheme during the construction, operational and decommissioning phases.

7.6 Air Quality

7.6.1 Existing Environment

The Air Quality Standards (AQS) Regulations describe the air quality zoning adopted in Ireland as follows:

- Zone A (Dublin Conurbation)
- Zone B (Cork Conurbation)
- Zone C (16 Cities and Towns with population greater than 15,000); and
- Zone D (Rural Ireland: areas not in Zones A, B and C).

The proposed scheme is located in Air Quality Zone D, Rural Ireland, as defined in the Air Quality Standards Regulations, 2011. Background levels from 2018-2022 provided by the EPA's annual reports *Air Quality in Ireland – Indicators of Air Quality* outlined annual air quality monitoring results for NO_2, SO_2, $PM_{2.5}$, PM_{10} and CO in Zone D which demonstrated good compliance with air quality standards (refer to Table 3).

Table 3 Annual mean background Concentrations for Zone D (Source: epa.ie)

Years	Annual Average NO_2 (µg/m³)	Annual Hourly Average SO_2 (µg/m³)	Daily Annual Average PM_{10} (µg/m³)	Annual Average $PM_{2.5}$ (µg/m³)	8-hour average CO (µg/m³)
2018	4.67	2.6	11.8	9.4	No data available
2019	5.67	3.1	14.25	9.29	No data available
2020	8.5	4.15	11.17	7.75	0.4
2021	7.52	4.16	11.94	8.71	0.3
2022	6.32	5.04	12.79	8.62	0.8
Average	6.536	3.81	12.39	8.754	0.5
Limit[6]	40	20	40	25	10

Note 1: Concentrations of each pollutant recorded in Zone D are averaged to represent typical background levels. In accordance with AQS, the average concentrations obtained from all stations complied with 90% data capture.

The prevailing wind direction at Lough Funshinagh is from the South/ Southwest.

7.6.2 Construction

Air emissions from the exhausts of construction plant, machinery and haulage trucks will be elevated during construction but are not expected to be significant. No odour emissions are envisaged from the proposed construction works. Some localised dust may be generated during the construction phase, however, these will not be significant due to and the nature and the short duration (up to one month) of the proposed works. Considering the limited construction works to be carried out and the minimal increase in construction traffic, no significant effect on air quality is predicted during the construction phase of the proposed scheme.

7.6.3 On-Site Operations

During the operational phase of the proposed scheme, it is expected that there will be air emissions from the two diesel-powered HPUs operating at the compound and the haulage trucks delivering fuel to the site, however, these are not expected to be significant.

The hydraulic pumping units (HPUs) are each 600kW diesel powered units and are below the threshold (1 MWth) for the Medium Combustion Plant (MCP) Regulations (SI No. 595 of 2017) whereby Article 4(1) states "*4. (1) These Regulations apply to combustion plants with a rated thermal input equal to or greater than 1 MW and less than 50 MW irrespective of the fuel that they use*". Therefore, the MCP Regulations do not apply to these HPUs.

No odour emissions are envisaged from the proposed construction works.

7.6.4 Decommissioning

The effects to air quality during decommissioning are expected to be similar to those encountered during construction. There may be some localised dust during the deconstruction of the intake compound, however, these effects are not expected to be significant due to the size of works being decommissioned. No significant impacts on air emissions are expected during the decommissioning phase.

[6] Limit for the protection of human health.

7.6.5 Conclusion

No significant impact on air quality is expected to occur during the construction, operation and decommissioning phases of the proposed scheme.

7.7 Climate

7.7.1 Existing Environment

According to the United Nations Integrated Panel on Climate Change (IPCC), in line with the global picture, Ireland's average temperature has increased by about 0.7°C over the last 100 years, and at a higher rate of increase over the last couple of decades.

Studies have shown that extreme rainfall events associated with climate change show more marked changes with more events occurring in autumn and a 20% increase in 2-day extreme rain amounts, especially in northern areas. Taking the projected precipitation changes into account, there is potential for a significant increase in the number of extreme discharge events and a slight increase in their intensity, leading to an increased probability of flooding in the future.

The EPA has published the latest national projections on greenhouse gas emissions[7] for Ireland which state that the total national greenhouse gas emissions in 2023 were estimated to be 60.62 Mt CO_2 eq. emissions. This represents a 3.8% decrease (2.366 Mt CO_2 eq. emissions) from 2022.

7.7.2 Construction

Potential effects in relation to carbon emissions relate primarily to emissions from construction vehicles. The proposed scheme will be delivered according to construction good practice to ensure any potential impacts in terms of climate change are negligible.

7.7.3 On-Site Operations

Potential effects in relation to carbon emissions relate primarily to emissions from the two 600kW diesel-powered HPUs which each have a run time of 100 hours per full tank. There will also be 4 x 3,000 litre diesel fuel tanks located in the intake compound to power the pumps. Based on the SEAI 2023 conversion and emission factor[8] for diesel (2.685 $kgCO^2/l$), it is estimated that each pump will produce 160 $kgCO_2$ per hour.

The overall runtime of the pumps will depend on the level of the lough however it is possible that the pumps will need to run 24 hours a day over the winter period when rainfall is highest (i.e. October to March). This would mean 4,368 hours per pump in the period October to March. Therefore, if it is assumed that over the duration of the project (24 months), the pumps may be running continuously for two winter periods, it would equate to 8,736 hours of run-time per pump.

Under this scenario (two pumps running 8,736 hours each), approximately 2,795,520 kg CO_2 (or 0.002795520 Mt CO_2) would be emitted over the duration of the proposed scheme.

Due to the short-term duration of the proposed scheme (up to 24 months) and relatively small incremental change in CO_2 emissions relative to 2023 national annual emissions (0.0046%), it is expected that there will be no significant impact on climate.

7.7.4 Decommissioning

Potential effects in relation to carbon emissions relate primarily to emissions from construction vehicles. The decommissioning phase of the proposed scheme is not expected to give rise to significant carbon emissions.

[7] Environmental Protection Agency (July 2024) Provisional 1990-2023 Inventory data (updated July 2024) . Available at: https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/latest-emissions-data/#

[8]SEAI conversion and emission factors (2023). Available at: Conversion Factors | SEAI Statistics | SEAI

7.7.5 Conclusion

It is not predicted that the carbon emissions generated from the proposed scheme will result in any significant impacts on climate.

7.8 Resource and Waste (Existing Land Use and Relative Abundance, Availability, Quality and Regenerative Capacity of Natural Resources and Production of Waste)

7.8.1 Existing Environment

The proposed scheme is located in an area classified as "Agricultural Areas" according to the EPA Corine (Coordination of Information on the Environment) land cover classification. The majority of the surrounding area has agricultural and residential use. The majority of the proposed scheme footprint is located on agricultural land. The main natural resources in the area are Lough Funshinagh, the Cross River and agricultural lands.

7.8.2 Construction

It is not anticipated that there will be a significant use of construction materials during the construction phase due to the nature of the proposed scheme. Surplus construction materials which are not required for use on site will be reused, recovered or disposed off-site. An appropriate waste collection permit holder will be used for removal of wastes from site.

All by-products and wastes removed from site will be reused, recovered, or disposed of in accordance with the Waste Management Act, 1996, as amended.

Minimal excavation is required for the proposed scheme as the pipework is to be laid overland and the intake compound will be constructed on the land surface. There will be a small quantity of surplus earthworks material to be removed off site as a result of the trenching required for the 3 no. road crossings and for the foundations for gates. The contractor will send any surplus excavated material which cannot be re-used on-site, for reuse off-site or disposal to a suitable licenced facility. The contractor will ensure that any interim storage or waste management facilities for excavated material have the appropriate waste licences or waste facility permits in place.

7.8.3 On-Site Operations

Minimal waste is expected to be generated during operations. All waste generated will be collected and stored in designated waste storage areas prior to removal by an appropriately licensed waste management contractor for off-site recycling/recovery/disposal. No new waste streams will be generated as a result of the proposed scheme.

It is therefore considered that the operational phase of the proposed scheme will not give rise to any significant effects on resources and waste during operation.

7.8.4 Decommissioning

Materials and waste may be generated during the decommissioning of the compound (stone, concrete and geotextile), pipeline (i.e. fencing) and the outfall (geotextile matting, natural flag stones and rock armour). Stone, rock armour and natural flag stones will be reused where possible.

It is likely that the concrete compound will need to be broken up on-site and sent offsite for recycling to a suitably licensed facility.

7.8.5 Conclusion

The proposed scheme is not predicted to have significant effects on resources and waste during the construction, operational or decommissioning phases.

7.9 Archaeology, Cultural and Architectural Heritage

7.9.1 Existing Environment

There are 33 recorded archaeological sites identified within the study area which is a 1km buffer from the proposed scheme (Figure 12).

These include several burnt mounds of likely Bronze Age date, various stone and earthwork sites such as ringforts, enclosures etc which are of possible prehistoric date and likely to have continued in use to the Medieval Period, the site of a castle of early modern date, and a sweathouse and burial ground of modern date.

There are also 10 redundant records within the study area. Some of these include information added at a later stage to existing records, while others record the location of quarries that may not be fully visible at ground level or have been filled, as well as natural landscape features.

There is no record of previous archaeological excavations undertaken along the pipeline route or within the 1km study area. However, regardless of archaeological excavation evidence, the large number of recorded features of possible Prehistoric and Early Medieval dates, as well as the record of some later periods features, suggest the likelihood of activity within the study area from Prehistoric to Modern periods.

The scheme's location within a low-lying valley of the upper Cross River near Lough Funshinagh, is likely to further indicate that, with easy access to water, resources and land for farming, this was an ideal settlement landscape from the Prehistoric Period onwards.

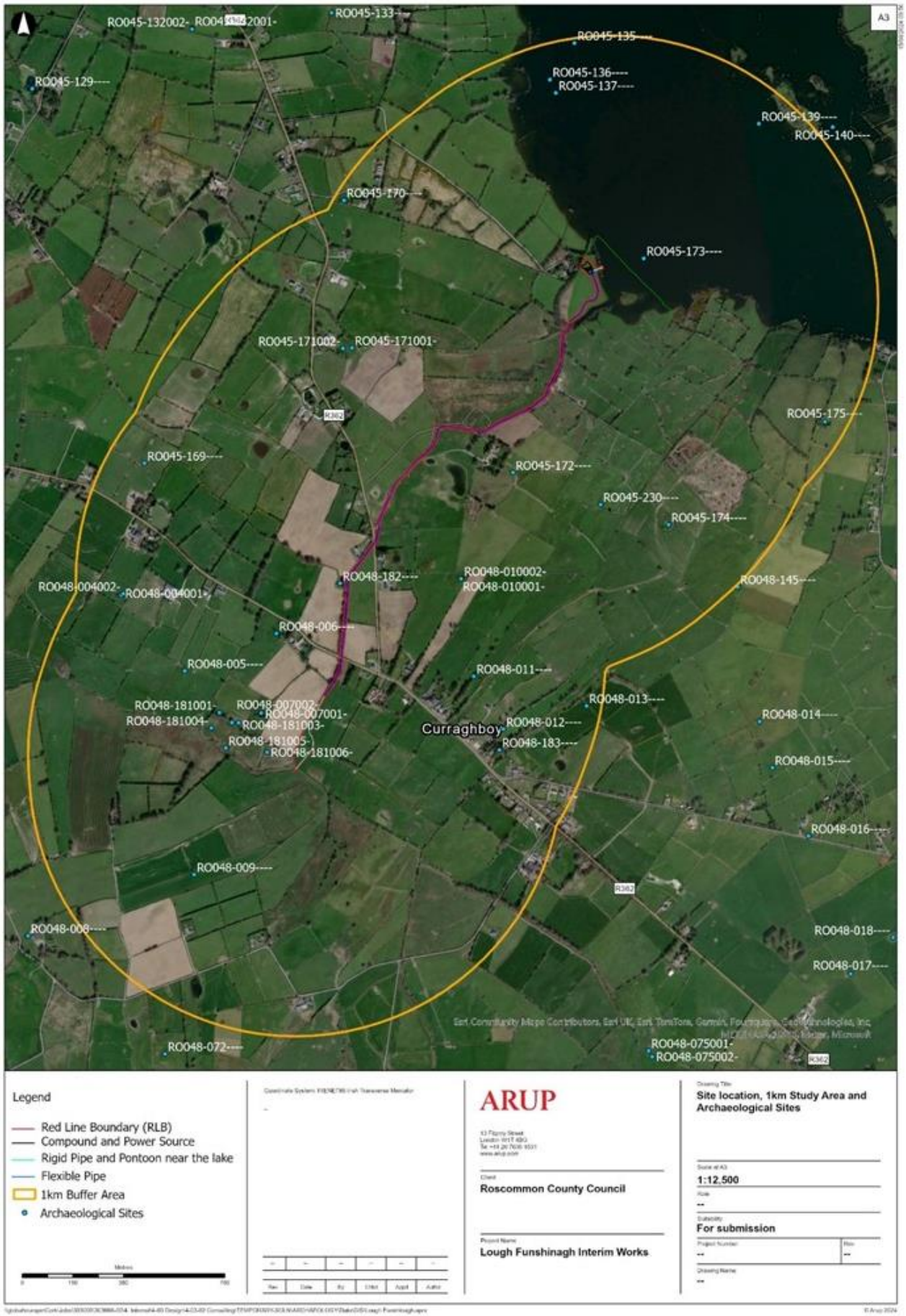

Figure 12 Archaeological study area | not to scale

7.9.2 Construction

The works associated with construction of the scheme are presented below in Table 4.

Table 4 Potential impacts and mitigation associated with the proposed scheme.

No.	Works	Potential impact	Mitigation
1	Installation of pump intake system within the underwater section of the field	Unknown archaeology within the submerged field disturbed	Pump intake system will be installed to be supported by the pontoon and sit on thin metal legs with plates at the bottom to avoid settlement
2	Establishment of intake compound next to lough	Unknown archaeology within field impacted by intake compound	A combination of geogrid and geotextile will be placed over the vegetation on the existing surface within the footprint of the proposed intake compound. The intake compound will be located next to existing access from landowner's yard, therefore an access track is not necessary and as such, the field will not be impacted by any machinery or vehicles.
3	Excavation under roads and either side of roads	Impact to unknown archaeology potentially under and to either side of roads	Impact unlikely due to depth similar to depths excavated for the laying of services previously. Regardless, the methodology for these excavations should be reviewed by an archaeologist. The excavations either side of the road should be subject to archaeological monitoring. Road crossings will necessitate pipes being run through hedgerows and stone walls. This will be done in such a way to minimise impact and hedgerows will be replaced by native species and stone wall rebuilding and repairs will be carried out by suitably experienced stonemasons.
4	Laying of pipe	Impact to unknown archaeology potentially within fields	Pipes will be laid overground (transported by tractor/excavator and trailer and laid by hand) across the field systems. They will not be pinned in place. In the field where the pipes transition to a single PE ribbed pipe, the ground beneath the PE ribbed pipe will be smoothed/rotovated to remove bumps and depressions within the soil surface from livestock hoofs. The maximum depth change will be 150mm which is less that the depth of influence in conventional agricultural tilling.
5	Protection of Cross River from scour and erosion including laying a geotextile and natural flag stones on the riverbed	Compaction of riverbed, affecting potential archaeology within riverbed	It is not considered that impacts are likely due to the shallow depth of this intervention and the relatively modern nature of the riverbed due to modifications over time. However, archaeological monitoring is required to monitor the laying of the geotextile and natural flag stones.

7.9.3 On-Site Operations

The operational phase of the proposed scheme, the pumping and pipes transporting water from the lough to the river, will have minimal impact on known / unknown archaeology.

The route of the pipeline does not come into contact with any recorded monuments and therefore no direct physical impacts would occur.

The route does however pass close to one recorded monument, a ringfort, reference RO048-182 which is located in the neighbouring field, to the west of the route. Due to the fact that without inspection it cannot be confirmed that part of the ringfort does not lie within the field containing the pipeline, the pipes will be located approximately 15m away from the boundary and laid on matting in this case.

The discharge/outfall point into the Cross River is in close proximity (c. 120m at closest point) to a cluster of recorded monuments (burnt mounds and remains of potential water mills). The riverbanks will be protected with geotextile layers and rock armour to ensure that erosion due to water flows does not expose potential archaeology within the riverbanks.

7.9.4 Decommissioning

The intake compound (concrete bund on compacted stone on geogrid and geotextile layers) along with the pump and pontoon will be carefully removed, and the field returned to its original use. The overland pipes and fencing will be removed by hand and transported by tractor/excavator and trailer. The geotextile layers, natural flag stones and rock armour will be carefully removed from the riverbanks. The soil beneath the compound and PE ribbed pipe will be rotavated to return soil to usable conditions. No impacts are foreseen from the decommissioning phase.

7.9.5 Conclusion

There is potential for archaeological remains from the Prehistoric to the Modern periods throughout the study area, with potential along the pipeline route concentrated at the section near to the ringfort site.

Due to the limited below ground impact, the proposed works will not result in physical impact(s) to any of the known archaeology (recorded monuments) located throughout the study area.

One ringfort, reference RO048-182, is located close to the pipeline route. As a recorded monument, the ringfort is afforded legal protection under the National Monuments Act. As such, mitigation strategies have been proposed to minimise any potential impact. As no below ground excavation is anticipated for the laying of the pipeline, no direct, physical impact on the ringfort is anticipated.

In conclusion, the proposed scheme will not result in any direct physical impacts to known archaeology during the construction, operational or decommissioning phases. Mitigation strategies are proposed on a best practice basis to minimise potential impacts to hitherto undiscovered archaeology.

7.10 Landscape and Visual

7.10.1 Existing Environment

The proposed scheme will be located on the southwest corner of Lough Funshinagh and will traverse agricultural land and the village of Curraghboy until reaching the Cross River. The area is considered of Moderate Value according to the Roscommon County Development Plan 2022-2028[9]. Lough Funshinagh is designated as a Special Area of Conservation (SAC) which is of aesthetic interest as well as ecological importance. There are several locations where views are provided from local roads overlooking Lough Funshinagh. The scenic viewpoint V22 is located approximately 1.3 km from the intake compound (Figure 13). The scenic view is to southwest, overlooking Lough Funshinagh. The surrounding area is characterised as rural agricultural land consisting of a rolling stonewalled low lying grassland landscapes.

The existing landscaping at the intake compound and pump intake system consists of a residential house, agricultural fields, hedgerows and scattered mature trees.

[9]Roscommon County Council (2022). Roscommon County Development Plan 2022-2028 Vol II. Available at: Roscommon County Development Plan 2022-2028 | Roscommon County Development Plan (rosdevplan.ie)

Figure 13 Scenic viewpoints near proposed scheme | not to scale

7.10.2 Construction

During construction there may be a slight, temporary landscape and visual impact as a result of construction machinery in the area. Three road crossings will be required, but these works will be short term and all roads will be reinstated once construction of the proposed scheme has been completed. The duration of construction is expected to be short (up to one month), and it is predicted that construction will have no significant effect on landscape or the visual setting.

7.10.3 On-Site Operations

The pump intake system and intake compound at the shore of the lough may be visible from the nearest public road (approximately 1.2km northeast of the compound) on the eastern shore. The intake compound is not in the direct line of sight of scenic viewpoint V22. Given the limited size of the compound and its short-term presence (up to 2 years) it is not anticipated to have a significant effect. The pipeline will consist of two lay flat pipes and stockproof fencing, this will have minimal visual effect.

7.10.4 Decommissioning

On decommissioning of the site, hedgerows will be restored and the landscape will be restored to its original condition with complete removal of the pumping intake system, the intake compound, pipeline and fencing. Therefore, no significant landscape or visual effects are anticipated during the decommissioning phase.

7.10.5 Conclusion

Considering the nature of the proposed scheme and short-term nature of operations, there will be no significant landscape or visual effects during construction, operations and decommissioning of the proposed scheme.

7.11 Material Assets

7.11.1 Existing Environment

The only existing services and utilities that could be affected by the proposed scheme are those within the public roads which will be traversed by the proposed pipes (2 no. public road crossings). It is known that an existing Uisce Éireann watermain and a fibre optic cable are present in at least one of the public roads.

7.11.2 Construction

Two 600mm diameter high-density polyethylene (HDPE) carrier pipes will be installed across the public roads, through which the two lay-flat water pipelines will be threaded. The solid pipe will be buried an appropriate depth (approximately 2m) to avoid any impact on existing services. Prior to undertaking any works, a cable avoidance tool (CAT) scan will be undertaken to identify any services in the road.

7.11.3 On-Site Operations

On-site operations will have no impact on existing services. The pumps will be powered by on-site diesel generators.

The operation of the proposed scheme is designed to help alleviate (on a short-term interim basis) the flood risk from Lough Funshinagh to Curraghboy village and affected landowners adjacent to the lough shore. This includes the associated existing material assets such as existing structures, services and infrastructure. Therefore, the proposed scheme is designed to mitigate existing predicted negative trends in the baseline environment.

7.11.4 Decommissioning

The decommission of the works will have no impact on existing services. The flexible pipes will be removed from the road crossing without disturbing the services identified during construction. The HDPE duct will remain within the road and will not be removed.

7.11.5 Conclusion

Existing services within the public roads will be identified and protected and no disruption to services is anticipated. No significant effects on material assets are predicted.

7.12 Major Accidents and/or Disasters

7.12.1 Existing Environment

As noted in the introduction, the purpose of the proposed scheme is to reduce (on a short-term and interim basis) the risk of flooding on nearby residences and Curraghboy village. As described in detail in the Engineering Report (MWP 2024), in the 'do-nothing scenario' i.e. if water levels in Lough Funshinagh rise without intervention, it is noted (Section 2.1 of the report) that "*If there is no intervention then rising water levels in the lough will be limited by water discharging by gravity and flowing overland in a southerly direction towards Curraghboy village and then onwards to discharge into the Cross River which flows in a southeasterly direction approximately 2km to the south of Lough Funshinagh*".

Risks associated with the proposed scheme relate primarily to the general site safety associated with the construction and operation of the proposed scheme and risks associated with working in proximity to a flood prone area i.e. Lough Funshinagh.

The design of the proposed scheme including the location of operations and infrastructure, has considered flood risk during the operation of the proposed scheme.

7.12.2 Construction

The construction contractor will ensure that the proposed scheme is constructed in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013). There is a low probability that accidents will occur as the construction works are standard in nature and well understood.

Normal good construction practice will ensure that the risk of accidents will be low. Specific spill prevention measures will be implemented by the construction contractor, as detailed in the CEMP which forms part of the plans and particulars for the proposed scheme and will be implemented by the construction contractor.

7.12.3 On-Site Operations

It is envisaged that the risk of accidents, having regard to substances or technologies used is very low with the implementation of mitigation measures. There is a potential risk during operation of diesel spills from the storage tanks and during fuel delivery operations.

The diesel storage tanks and HPUs will be located within a concrete bund with 110% storage capacity for two of the fuel tanks (i.e. 6,600 litres) and additional allowance for rainfall accumulation. The intake compound has been sited at a level which is above the highest predicted water level, to eliminate the risk of inundation of the tanks and pumping machinery during operations. The HPUs have also been placed on plinths within the bunded area. Refuelling shall take place with the truck parked over a portable PVC containment bund mat. This is designed for use under vehicles and shall act as a containment system to catch any spills which may occur during refuelling.

During operation, water will be discharged through the pipeline into the Cross River. Detailed analysis[5] has been undertaken to assess the risk of flooding from this pumped discharge both at the outfall location and further downstream and the risk is considered low. To mitigate any potential risk of flooding downstream in the Cross River, water levels will be monitored, and pumping will cease when there is any potential for peak flood events in the receiving water body. There will therefore be no potential for the proposed scheme exacerbating flood events downstream of the discharge point in the Cross River. No significant effects are predicted.

The operation of the proposed scheme is designed to help alleviate (on a short-term interim basis) the flood risk from Lough Funshinagh to Curraghboy village and affected landowners adjacent to the lough shore.

7.12.4 Decommissioning

The potential risks during the decommissioning phase will be similar to those in the construction phase. The works during the decommissioning phase will follow the same mitigation measures to be implemented during construction.

7.12.5 Conclusion

Given the type of development proposed, the likelihood of the proposed scheme to cause a major accident or disaster is extremely low. There is a low probability for accidents to occur as the construction works are standard in nature and well understood. Normal good construction practice and construction mitigation measures (with regards to safety) ensure that the risk of accidents on site are low.

Overall, the proposed scheme will help alleviate the flood risk from Lough Funshinagh to Curraghboy village and affected landowners adjacent to the lough shore and therefore will mitigate the existing negative trends in the baseline environment.

7.13 Interaction between the above factors

Construction

During construction the following potential interactive effects have been considered:

- Noise (from traffic and works) and air quality (i.e. dust) impacts have been considered in terms of effect on people during the construction works
- Water quality impacts have been considered in terms of effects on biodiversity
- The potential for major accidents (e.g. spills) and the effect this may have on soils, groundwater, surface water and biodiversity has been considered.

These interactive effects have been considered in the relevant sections and no significant interactive effects are predicted.

On-site Operations

During operations the following potential interactive effects have been considered:

- Noise from the operation of the pumps on local residents
- Water quality impacts from the transfer of water from Lough Funshinagh to the Cross River on biodiversity in the Cross River and downstream
- Potential for hydrological effects on the risk of downstream flooding in the Cross River.

These interactive effects have been considered in the relevant sections and no significant interactive effects are predicted.

Decommissioning

During decommissioning the following potential interactive effects have been considered:

- Noise (from traffic and works) and air quality (i.e. dust) impacts have been considered in terms of effect on people during the decommissioning works
- Water quality impacts have been considered in terms of effects on biodiversity
- The potential for major accidents (e.g. spills) and the effect this may have on soils, groundwater, surface water and biodiversity has been considered.

These interactive effects have been considered in the relevant sections and no significant interactive effects are predicted.

7.14 Cumulative Effects with other planned/permitted developments.

7.14.1 Methodology

Part 1 (b) of Annex III of the EIA Directive (2014/52/EU) requires EIA Screening to have regard to

"*(b) cumulation with other existing and/or approved projects*;"

In line with the Directive, the cumulative effects of the proposed scheme have been considered in the context of approved or planned projects.

A search for planned or permitted developments surrounding Lough Funshinagh, near the pipeline route and along the Cross River has been conducted from various sources (see below). The search dismissed developments of a domestic scale, for example once-off dwellings, domestic extension works, etc., as such projects are of a scale that are unlikely to have a significant cumulative effect on the proposed scheme, however, records for these applications have been included in Table 5 for completeness.

For planning applications granted by Roscommon County Council and An Bord Pleanála, only those approved in the last five years have been considered. It has been assumed that those applications approved over five years ago have already commenced construction or have been completed and therefore the likelihood of the proposed scheme and such projects coinciding and having a significant cumulative effect on the environment as low.

The following sources for existing and/or approved projects have been used:

- Roscommon County Council, planning search portal[10] (ePlan) for private developments. Checked 7th August 2024
- Local Authority Development by Roscommon County Council[11] i.e. Part 8 of the Planning and Development Regulations 2001, as amended. Checked 7th August 2024
- An Bord Pleanála online map search[12]. Checked 7th August 2024
- Uisce Éireann, Projects database[13]. Checked 7th August 2024
- Environmental Protection Agency, Licence Applications and Amendments for facilities within 1km of the proposed scheme and the Cross River. Checked 7th August 2024

[10] Roscommon County Council, ePlan, planning search portal, https://www.eplanning.ie/RoscommonCC/SearchExact

[11] Roscommon County Council, Consultation Portal, https://meetings.roscommoncoco.ie/mgConsultationListDisplay.aspx?h=1

[12] An Bord Pleanála, online map search, available at: https://www.pleanala.ie/en-ie/map-search

[13] Uisce Éireann, Projects, https://www.water.ie/projects

- National Building Control and Market Surveillance Office, Commencement Notices[14]. Checked 7th August 2024.

7.14.2 Existing and Approved Projects Considered

Table 5 below presents the existing and approved projects considered in respect of their potential to have cumulative effects on the environment with the proposed scheme.

[14] National Building Control and Market Surveillance Office, Commencement Notices, https://www.nbco.localgov.ie/

Table 5 Cumulative Assessment of the proposed scheme.

Planning / App. No.	Project Details	Distance from proposed scheme	Potential for In-Combination Effects
n/a	Roscommon County Council Planning Search: Roscommon Town public realm works	15 km	Roscommon Town public realm works, comprising the resurfacing and renewal of the existing urban town centre environment, has been submitted for planning approval (June 2024) Roscommon town is 15km north of the proposed scheme. Given the distance and nature of the works proposed for both schemes, no significant cumulative effects are predicted.
n/a	Roscommon County Council Planning Search / Uisce Éireann The ongoing works associated with the Athlone Water Supply Scheme Upgrade Phase 2[15], located in Monksland Business Park.	11 km	This project is ongoing with the advanced phase 2 works reported as being complete. The construction stage of Phase 2 was due to commence in 2023 and to include expanding the existing pumping station and upgrading a number of elements of the plant including the primary treatment processes as well as disinfection process. The water treatment plant is located adjacent to the River Shannon in Athlone town centre, approximately 3km upstream of where the Cross River flows into the River Shannon. Therefore, given the nature of the upgrade works, the location of the treatment plant relative to the Cross River outflow to the River Shannon and the nature and duration (short-term) effects of the proposed scheme on water quality, no significant cumulative effects are predicted.
21405	Roscommon County Council Planning Search/ Commencement Notice: Permission for a ground floor extension to existing at Jazz Pharmaceuticals, Monksland (21405). Commencement notice issued on the 10/11/2021. Planning Application Granted with Conditions	10 km	Jazz Pharmaceuticals is located approximately 100m from the Cross River in Monksland, Co. Roscommon which is approximately 10km southeast of the proposed scheme outflow. The facility operates under an Industrial Emissions Licence (IEL) from the EPA (IEL Reg. P0987-01). Given the date of the commencement notice, the works are or will likely be complete when the construction for the proposed scheme commences. In addition, given the nature of the planned works and the controls and monitoring that IEL sites are subject to, no significant cumulative effects are predicted.
313750	An Bord Pleanála: Applicant: Energia Renewables ROI Ltd.	9.8 km	Location: Cuilleenoolagh and other townlands, Co. Roscommon. Permission was granted on the 23/1/2023 for a windfarm development (20 No. turbines) and all associated works. The part of the underground cabling which follows the route of the R362 passes over the Cross River approximately 9.8 km downstream of the outfall location. Granted Part Development 23/11/23

[15] Uisce Éireann, https://www.water.ie/projects/local-projects/athlone-water-supply-scheme#:~:text=Other%20investment%20in%20the%20Athlone%20Water%20Supply%20Scheme%3A&text=This%20includes%20upgrading%2C%20replacing%2C%20and,station%20for%20the%20Annagh%20Reservoir.

Planning / App. No.	Project Details	Distance from proposed scheme	Potential for In-Combination Effects
			Given the nature of the development in the vicinity of the Cross River and its location downstream of the proposed scheme, as well as the fact that the proposed wind farm cabling passes over the river and that this consented development was subject to EIA and AA as appropriate with mitigation measures to ensure no significant effects, no significant cumulative effects are predicted.
317588 18256	An Bord Pleanála/ Roscommon County Council Planning Search: Applicant: Greener Ideas Ltd. Conditional Permission Granted	11.5 km	Permission was granted on the 16/01/2024 for a 110kV single-bay air insulated substation (Cuilleen), 110kV underground grid connection and all associated works (Case no. 317588). This development is located approximately 11.5 km downstream of the outfall location on the Cross River. With the application of mitigation measures from this project, no potential for in-combination effects anticipated.
n/a	EPA Licensing: Application P1197-01 (Status: Applied) for a Bord Gáis Energy Power Plant	12 km	Application P1197-01 (Status: Applied) for a Bord Gáis Energy Power Plant with capacity to generate up to 102 MW of electricity. The development boundary is located 20 m from the Cross River approximately 12 km downstream of the outfall location. There will be no wastewater discharged into the Cross River, but surface water discharge will be charged into the Cross River, following the implementation of several mitigation measures. The proposed scheme will have no impact on flood risk in the Cross River, so therefore there is no potential for cumulative effects on the Cross River arising from this project with the proposed scheme. No other potential cumulative effects on the environment have been identified, based on the nature of the granted developed and the interim nature of the proposed scheme.
22351	Roscommon County Council Planning Search: Applicant: Private resident Conditional Permission Granted.	4.9 km	Permission for development consisting of: Demolition of sections of the existing dwelling located to the east and south of the dwelling, demolition of existing porch, removal of existing roof and demolition of existing shed; (ii) Construction of an extension to the east and south elevations of the existing dwelling, new rooflights, construction of a new porch, and construction of a new garage; (iii) Decommissioning of existing septic tank and soak away and installation of a new treatment system and percolation area and all associated site works (Application made for Permission for development consisting of: Demolition of sections of the existing dwelling located to the east and south of the dwelling, demolition of existing porch, removal of existing roof and demolition of existing shed; (ii) Construction of an extension to the east and south elevations of the existing dwelling, new roof with raised eaves and ridge level and new rooflights, construction of a new porch, and construction of a new garage; (iii) Decommissioning of existing septic tank and soak away and installation of a new treatment system and percolation area and all associated site works) at Ballycreggan, Kiltoom, Co. Roscommon. Given the domestic scale of the development, no significant cumulative effects are predicted.

Planning / App. No.	Project Details	Distance from proposed scheme	Potential for In-Combination Effects
22445	Roscommon County Council Planning Search: Applicant: Private resident Conditional Permission Granted.	5.3km	Permission to construct 1 No. dwelling, garage, entrance onto road, new wastewater treatment system and percolating area and all associated site works at Ballycreggan Kiltoom Roscommon Given the domestic scale of the development, no significant cumulative effects are predicted.
20370	Roscommon County Council Planning Search: Applicant: Collins Boyd Engineering Ltd Conditional Permission Granted.	9.7 km	For the construction of 8 no two storey detached houses including connections to existing public services and sewers, landscaping and all associated infrastructure works and services at Waterville Housing Estate, Monksland, Bealnamulla, Athlone. The developed is located on approximately 800m from the Cross river and approximately 9.7 km downstream from the outfall location. Given the nature of the development and its location downstream of the Cross River, it is not envisaged that there will be significant cumulative effects.

8. Screening Checklist

The potential environmental effects associated with the proposed scheme have been outlined in the previous sections of this report.

The EC Guidance on EIA Screening (EC, 2017) provides a checklist to help users decide whether EIA is required based on the characteristics of a project and its environment. This screening checklist is included in Table 6**.**

Table 6 Screening checklist to determine if EIA is required based on the characteristics of a project and its environment.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
1. Will construction, operation or decommissioning of the project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?	Yes	No A Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) report has been prepared for the proposed scheme, which has concluded that the proposed scheme will not have any significant effects on the conservation objectives of any European site. The proposed scheme is in an area classified as "Agricultural Areas" according to the EPA Corine land cover classification. There is no expected significant impact on land use expected as the proposed because will be in place for up to 2 years and upon decommissioning, land will be reinstated, and any hedge rows removed will be replanted and stone walls rebuilt. The abstraction of water from Lough Funshinagh and the discharge to the Cross River have been considered from a hydrological, hydrogeological, geomorphological and water quality perspective. No significant effects are envisaged during operation of the scheme. The proposed scheme is designed to help alleviate flood risk in the area, on an interim basis.
2. Will construction or operation of the project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?	Yes	No Construction materials will include stone, concrete, fencing etc. It is not anticipated that there will be a significant use of construction materials during the construction phase due to the nature of the proposed scheme. The operation of the proposed scheme will utilise diesel as the source of energy for the hydraulic pumps. The expected duration of the proposed scheme, indicates that the scheme is not likely to result in a significant impact to natural resources.
3. Will the project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	Yes	No The type of construction materials to be used during the construction phase are not harmful to human health or the environment. The appointed contractor will ensure all materials generated as a result of the proposed scheme will be managed in accordance with relevant waste management legislation.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
		During operations, diesel fuel will be stored in a bund tank at the intake compound and may be harmful to human health or the environment if a spill occurs. However, the proposed mitigation measures ensure that spill incidents are unlikely and therefore it is not likely to have a significant impact on human health or the environment.
4. Will the project produce solid wastes during construction or operation or decommissioning?	Yes	No The construction phase will produce very small amounts of earthworks materials from the excavation for the road crossing and for the foundations for gates. All other infrastructure will be placed on the existing ground surface. Therefore, no significant impact is expected. It is not considered that there will be a significant use of construction materials during the construction phase. Surplus construction materials which are not required for use on site will be reused, recovered or disposed off-site. Minimal waste materials will be generated during the operational phase. During decommissioning, the concrete intake compound, stone aggregate and geotextiles will be removed. All by products and wastes removed from site will be reused, recovered, or disposed of in accordance with the Waste Management Act, 1996, as amended.
5. Will the project release pollutants or any hazardous, toxic or noxious substances to air or lead to exceeding Ambient Air Quality standards in Directives 2008/50/EC and 2004/107/EC?	No.	No. The construction and decommissioning phase will see the use of machinery and plant on site, but on a very limited basis. During operation, the 2no. 600kw diesel powered hydraulic power units will operate to pump water from the lough to the River Cross, with resultant carbon emissions. The duration of these emissions is limited by the interim nature of the scheme (up to 2 years).
6. Will the project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	Yes	No Noise will be generated during the construction and decommissioning of the proposed scheme due to construction traffic, construction machinery, excavation works etc. The effect of construction noise on sensitive receptors (residential dwellings) in the immediate vicinity of the site will be temporary due to the short-term duration of the construction and decommissioning works. Noise will be generated from the HPUs during operation. While the HPUs will be surrounded by a c. 4m acoustic barrier, there is the potential for significant noise effects during operation at the nearest residence. Re-housing is being offered to the residents of this nearest receptor, for the duration of the scheme.
7. Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal waters or the sea?	Yes	No There is the potential for discharge of silt and/or hydrocarbons during the construction, operational and decommissioning phases. Suitable mitigation and standard construction practice has been included to ensure no significant effects in this regard. A CEMP has also been prepared for the proposed scheme.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
		The discharge of water from Lough Funshinagh to the River Cross could potentially lead to a deterioration in water quality in either or both water bodies. A detailed assessment has been undertaken and suitable mitigation is proposed to ensure significant effects will not result. A water quality monitoring programme is proposed for the operational phase to monitor ongoing water quality and take additional measures if required.
8. Will there be any risk of accidents during construction or operation of the project which could affect human health or the environment?	Yes	No. The construction phase of the proposed scheme is likely to give rise to increased risk of major accidents due to the use of large, mobile machinery and heavy equipment and materials. However, it is expected that standard best practice construction measures will be implemented by the contractor which will reduce the risk of accidents occurring. All works will also be carried out in accordance with the Safety, Health, and Welfare at Work (Construction) Regulations, 2006 (SI No. 504 of 2006). Normal good construction practice will ensure that the risk of accidents will be low. It is envisaged that the risk of accidents, having regard to substances or technologies used is very low.
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?	Yes	No The construction phase is expected to be up to one month in duration and have a small number of contractor staff involved. The operation of the proposed scheme will not lead to a significant number of employees regularly on site. The scheme is designed to provide interim flood protection for property in the vicinity, which will mitigate current negative trends in flood risk.
10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?	No	No In the event the proposed scheme overlaps with other projects within its vicinity, all works will be carried out in accordance with the relevant planning conditions and will be co-ordinated to ensure no major interference. Taking into consideration the nature and scale of the proposed scheme and the limited construction works to be carried out, no significant cumulative effects during the construction, operational or decommissioning phase are predicted.
11. Is the project located within or close to any areas which are protected under international, EU, or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?	Yes	No A Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) has been prepared for the proposed scheme, and it concludes that due to the nature and scale of the proposed works, it is anticipated that the proposed scheme will not have a significant effect on the conservation objectives of any European sites.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
12. Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g., wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, which could be affected by the project?	Yes	No An Ecological Impact Assessment Report has been prepared for the proposed scheme, and it concludes that due to the nature and scale of the proposed works, the proposed scheme will not have a significant impact on any important or sensitive ecological areas near the site.
13. Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?	Yes	No The proposed scheme is not expected to have any significant effect on sensitive features within the site. An Ecological Impact Assessment Report has been prepared for the proposed scheme, and it concludes that due to the nature and scale of the proposed works, the proposed scheme will not have a significant impact on any important or sensitive ecological areas near the site. A Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) Report has been prepared for the proposed scheme, and it concludes that due to the nature and scale of the proposed works, it is not anticipated that the proposed scheme will not have a significant effect on the conservation objectives of any European sites.
14. Are there any inland, coastal, marine or underground waters (or features of the marine environment) on or around the location that could be affected by the project?	Yes	No The proposed scheme is designed to pump water (on a short-term interim basis) from Lough Funshinagh to the Cross River, to help alleviate the risk of flooding of properties and the village of Curraghboy. A Water Framework Directive Assessment Report has been prepared for the proposed scheme, and it concludes that due to the nature and scale of the proposed works, it is not anticipated that the proposed scheme will have a significant impact in respect of the requirements of the Water Framework Directive.
15. Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?	Yes	No The area is considered of Moderate Value according to the Roscommon County Development Plan 2022-2028 and the proposed scheme is not in the direct line of sight of the scenic viewpoint V22. Considering the size of the proposed scheme and interim nature of operations, there will be no significant landscape and visual effects on during construction, operation and decommissioning of the proposed scheme.
16. Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes	There are residential properties and farms which will use sections the route to access amenities and will cross under two public roads and one private road. The construction and decommissioning phase of the proposed scheme may cause a short-term increase in traffic movements but these will be of a temporary nature. The proposed construction works will require the temporary closure of traffic lanes to facilitate a safe working area. However, to limit the impact, because one lane will always be available for traffic. Operation of the proposed scheme will not have a significant impact on increases in traffic.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
17. Are there any transport routes on or around the location which are susceptible to congestion, or which cause environmental problems, which could be affected by the project?	No	No. Careful and considered local consultation will be carried out with nearby residences to ensure that the minimum amount of disturbance will be caused. Access to the properties where construction works are proposed will be maintained at all times during the construction and decommissioning phase. Construction and decommissioning of the proposed scheme may cause a short-term insignificant increase in traffic movements regarding plant and machinery and deliveries. These effects will be insignificant and temporary. Operation of the proposed scheme will not have a significant impact on traffic.
18. Is the project in a location where it is likely to be highly visible to many people?	No	No The scheme is located in a rural setting and predominately in private land. During construction there may be a slight, temporary impact on landscape and visual as a result of construction machinery. Considering the size of the proposed scheme and interim nature of operations, there will be no significant effects on landscape and visual during construction, operations and decommissioning of the proposed scheme
19. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?	Yes	There is potential for archaeological remains from the Prehistoric to the Modern periods throughout the study area, with potential along the route concentrated at the section near to the ringfort site. Due to the limited below ground impact, the proposed works will not result in physical impact(s) to any of the known archaeology (recorded monuments) located throughout the study area. Mitigation strategies are proposed on a best practice basis to minimise potential impacts to hitherto undiscovered archaeology.
20. Is the project located in a previously undeveloped area where there will be loss of greenfield land?	Yes	No The proposed scheme is located on greenfield land. Little to no excavation is proposed as all infrastructure is to be located on the ground surface, save for 3 no. road crossings and gate foundations. The proposed scheme will only be in operation for up to 2 years and upon decommissioning the land will be restored to its original land use. Therefore, the proposed scheme will not result in permanent loss of greenfield land.
21. Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?	Yes	No The proposed scheme is located predominately on private property (residential and agricultural). Access to the properties where works are proposed will be always maintained during the construction, operation and decommissioning phase. The proposed scheme will pass beneath two public roads. The construction phase of the pipeline crossing the road may cause some disruption to traffic, however, one lane of traffic will always remain open.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
22. Are there any plans for future land uses on or around the location which could be affected by the project?	No	No The proposed scheme will operate up to 2 years and upon completed all associated infrastructure will be decommissioned and previous land use will be reinstated.
23. Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?	No	No The proposed scheme will transverse agricultural land and residential dwellings are typically once-off housing. To the southeast of the pipeline route the village of Curraghboy is located on the R362, however, the route avoids the centre of the town. Air and noise emissions during the construction phase are not predicted to be significant and will be in line with the relevant guidelines. Noise emissions may be generated during the operational phase, however, appropriate mitigation measures are proposed to minimise impacts. Careful and considered local consultation will be carried out with nearby residences to ensure that the minimum amount of disturbance will be caused.
24. Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project?	Yes	No There are one-off residential dwellings in the surrounding rural areas along the proposed scheme route. The nearest residential receptor is 35 m west of the intake compound. Specific noise mitigation measures have been included to reduce impacts of operational noise on the residential receptor near the intake compound, including the offer of re-housing for the duration of the scheme. There may be potential temporary impacts on traffic, air quality and noise as a result of the construction and decommissioning of the proposed scheme. However, these topics have been addressed in this report, and due to the scale and temporary nature of the construction, significant impacts are not predicted. Access to all dwellings will be maintained and the contractor will communicate to all residents (and businesses) in advance of the works. No other sensitive land uses are anticipated to be impacted.
25. Are there any areas on or around the location which contain important, high quality or scarce resources e.g., groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?	Yes	No A Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) Report, a WFD Assessment Report, an Archaeological Impact Assessment Report and an Ecological Impact Assessment Report have been prepared for the proposed scheme and all have concluded that there are no significant effects from the proposed scheme, with the implementation of mitigation.
26. Are there any areas on or around the location which are already subject to pollution or environmental damage e.g., where existing legal environmental standards are exceeded, which could be affected by the project?	No	No There are no known areas identified within the proposed works area which are already subject to pollution or environmental damage.

Brief Project Description	Yes/No	Is this likely to result in a significant impact Yes/No - Why
27. Is the project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g., temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes	No The area surrounding Lough Funshinagh has the potential to flood. The proposed scheme is an interim flood relief scheme to help reduce the potential for a flood event in the vicinity. The intake compound will be located above the highest predicted water level, to eliminate the risk of inundation of the tanks and pumping machinery.

9. Other Relevant Assessments

For completeness, it is confirmed that the results of other relevant assessments of the effects on the environment carried out pursuant to European Union legislation other than the Environmental Impact Assessment Directive have been taken into account in the preparation of this EIA Screening.

With particular reference to, for example, article 120(1A)(a) of the Planning and Development Regulations 2001, as amended, the following information shows how the results of these other assessments have been taken into account.

Table 7 Results of the assessment under consideration of other legislation

Other Legislation	Assessment outcomes
Habitats and Birds Directive	A Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) has been prepared for the proposed scheme, which has concluded that the proposed scheme will not have any significant effects on the conservation objectives of any European site. The assessment of likelihood of impact on the environment, including on biodiversity, has taken this into account.
Water Framework Directive	A Water Framework Directive Assessment report has been prepared for the proposed scheme, which has concluded that the proposed scheme will have no significant effects on the on the water quality and quantity, and hydrologically connected protected areas as a result of the proposed scheme.
Waste Framework Directive	Section 7.8 of this report (EIA Screening) has considered the anticipated waste streams generated during the proposed scheme. A CEMP has been prepared which outlines the waste management requirements during the construction and decommissioning phase of the proposed scheme which is aligned with basic waste management principals.
Environmental Noise Directive	Section 7.5 of this report (EIA Screening) has considered the likely noise impacts on nearby sensitive receptors. The assessment concluded that the proposed scheme will not have significant effects.
Floods Directive (2007/60/EC)	The proposed scheme aligns with the objectives of the directive which is to reduce and manage risks that floods pose to human health, the environment, cultural heritage and economic activity. The proposed scheme provides short-term measures to mitigate flood risk to properties nearby Lough Funshinagh and Curraghboy village.

10. Conclusion

This conclusion of the EIA Screening is based on the screening checklist in the previous section, the nature of the proposed scheme, the baseline environment in the area and the likely significant effects of the proposed scheme.

The nature, scale and location of the proposed scheme is such that there is no likelihood of significant adverse effects on the environment arising from the proposed scheme.

It is the conclusion of this report that EIA is not required for the proposed scheme.

11. References

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Planning and Development Act, 2000 (No. 30 of 2000).

Planning and Development Regulations (SI 600 of 2001), as amended by S.I. 404 of 2018 European Union (Planning and Development) (Environmental Impact Assessment) (no 2) Regulations of 2018

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Safety, Health, and Welfare at Work (Construction) Regulations, 2006 (SI No. 504 of 2006).

Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (2011) *Guidelines for Treatment of Air Quality during the Planning and Construction of National Road Schemes.*

Transport Infrastructure Ireland (TII) (2014) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Scheme.*

Appendix A

Statement of Competencies

The statements of competencies for the contributing authors to this EIA screening report are provided below:

Dan Garvey (BA Hons, MSc, CEnv MIEnvSc, CGeog FRGS) approved this report as a competent expert. Dan is an Associate Director chartered environmental consultant at Arup, leading the environmental consulting team in Arup's Cork office. He has over 20 years' experience in environmental impact assessment and has prepared or supervised the preparation of more than 35 environmental impact statements/ environmental impact assessment reports. He has been the lead environmental consultant on large complex projects including flood relief schemes, sustainable transportation projects, wind energy, gas infrastructure, an international electrical interconnector, pharmaceutical, mixed-use urban, data centres, brewing/ distillation, waste-to-energy and educational projects.

Alex Fleming (BSc, MSc, C.WEM) is a senior chartered environmental consultant at Arup, with nine years' experience in environmental impact assessment. Her projects include flood relief schemes, waste-to-energy, industrial, environmental due-diligence, and private developments. Alex is the principal environmental consultant on the Glashaboy Flood Relief Scheme and the Midleton Flood Relief Scheme (both in Cork), and Coirib go Cósta – Galway City Flood Relief Scheme.