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# Appropriate Assessment Screening and Natura Impact Statement

Uisce Éireann

October 2026

# BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

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# 1. Introduction

This Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS) presents an assessment of the likely significant effects and identifies applicable mitigation measures in respect of the proposed Ballina and Lough Talt Water Supply Upgrade (hereafter referred to as the 'Proposed Development'). This AA Screening and NIS will support a planning application for the Ballina & Lough Talt Water Supply Upgrade, a Strategic Infrastructure Development, to An Coimisiún Pleanála direct.

## 1.1 Nature and Extent of the Proposed Development

The Proposed Development comprises both existing and new infrastructure, as well as above ground and below ground elements. This section describes the spatial extent, key components and operational parameters of the Proposed Development.

The Proposed Development site is located in the townlands of: Wherrew, Lisglennon, Ballinteean, Rathglass East, Derreens, Broadlands, Coonealmore, Rosserk, Coonealcauraun, Rathroeen, Culleens, Laghtadawannagh, Farrannoo, Garrankeel, Quignamanger, Quignalegan, Rathmeel, Quignashee, Ballyholan, Behy More, Corrimbla South, Carrownlabaun, Bonniconlon West, Bonniconlon East, and Drumsheen, Co. Mayo; and Knockasliggaun, Glennawoo, Largan, and Gortersluin, Co. Sligo; and Lough Conn, Co. Mayo, and Lough Talt, Co. Sligo.

The Proposed Development, subject to detailed design, will consist of seven "key locations" and five discrete sections of pipeline, as follows:

- Upgrade to the existing **Wherrew Raw Water Intake & Pumping Station (RWI&PS)**, Wherrew, Ballina, Co. Mayo;
- Upgrade to the existing **Lisglennon Raw Water Storage and Pumping Station** (RWS&PS), Lisglennon, Ballina, Co. Mayo;
- **Proposed Pipeline A** – Lisglennon Raw Water Pumping Station to Lisglennon Water Treatment Plant (WTP);
- Upgrade to the existing **Lisglennon WTP**, Lisglennon, Ballina, Co. Mayo;
- **Proposed Pipeline B** – Lisglennon WTP to Existing River Moy Crossing;
- **Proposed Pipeline C** – Existing River Moy Crossing to Bonniconlon Booster Pumping Station (BPS);
- **Proposed Pipeline D** – Bonniconlon BPS to Windy Gap Break Pressure Tank (BPT);
- **Proposed Pipeline E** – Windy Gap BPT to Lough Talt WTP;
- Proposed **Bonniconlon Booster Pumping Station (BPS)** located at Bonniconlon, Ballina, Co. Mayo;
- Proposed **Windy Gap BPT** located at the Windy Gap, Ballina, Co. Mayo;
- Repurposing the existing Lough Talt WTP, Co. Sligo;
- Proposed Treated Water Reservoir at the existing **Bonniconlon Reservoir** site, Ballina, Co. Mayo; and,
- All permanent and temporary works, including construction compounds, access routes, pipeline corridors, and trenchless crossings.

A schematic overview of the development is shown in Figure 1-1. For ease of reference, raw water and treated water assets have been identified and shown separately. The pipelines have been labelled Pipeline A to Pipeline

E, identified between origin and termination points. A graphical overview of the Proposed Development is provided in Figure 1-2.

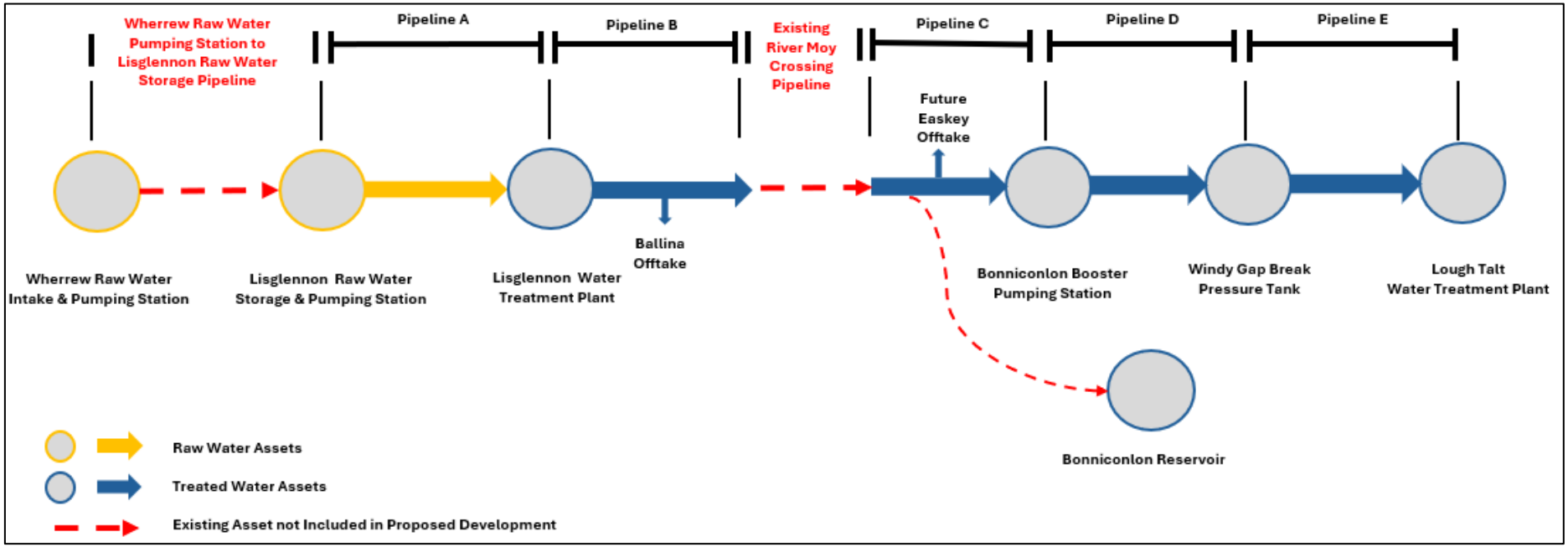



**Figure 1-1 — Schematic Overview of the Proposed Development**

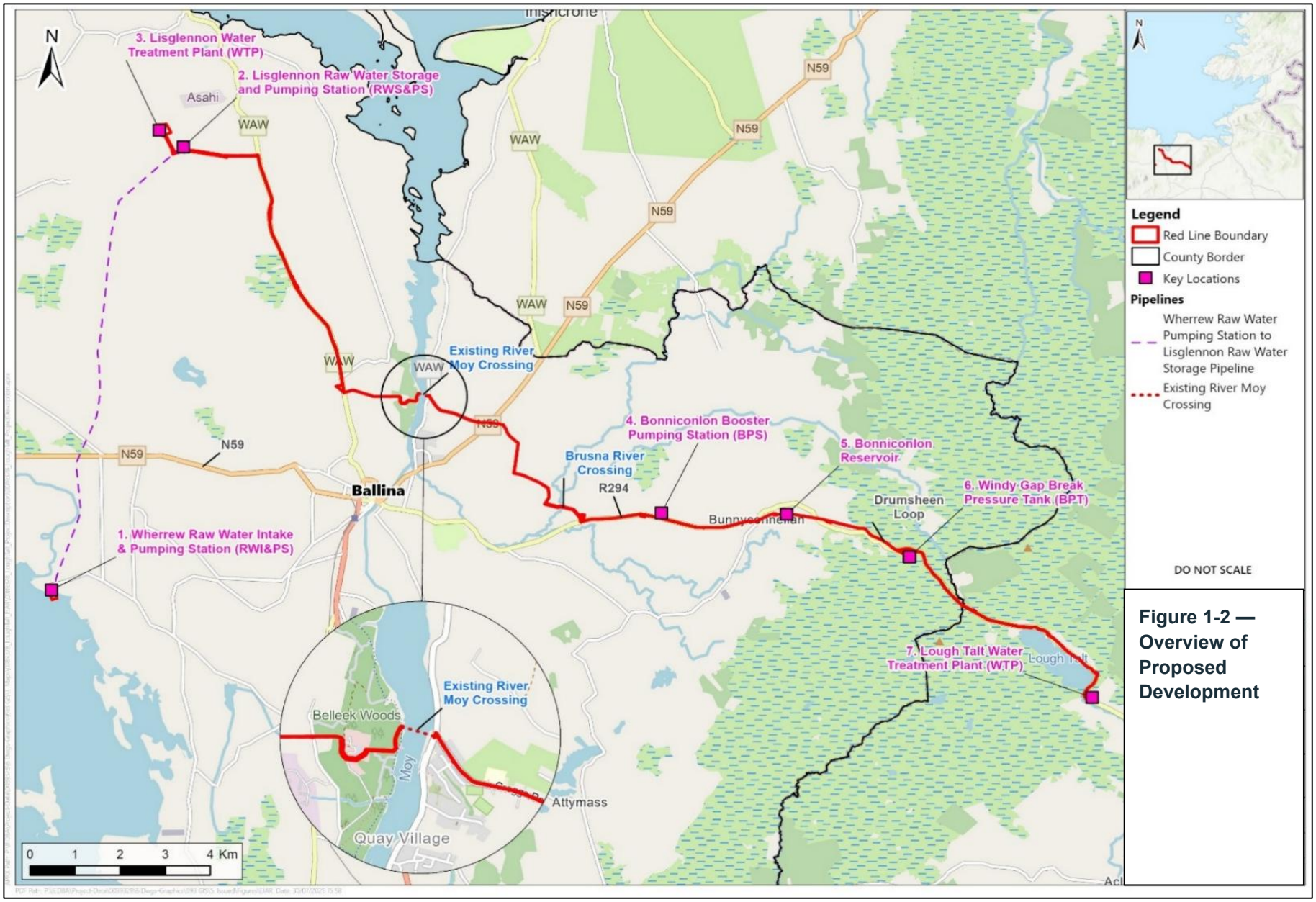



**Figure 1-2 — Overview of Proposed Development**

## 1.2 Existing and Proposed Infrastructure

In this section, a summary of the existing infrastructure is provided, then the proposed upgrades or infrastructure is set out.

### 1.2.1 Wherrew Raw Water Intake and Pumping Station

#### 1.2.1.1 Existing site

The existing site at Wherrew, Cloghans, Ballina, Co. Mayo is located at the top of small bay known as Kent's Pool, on the north-eastern shoreline of Lough Conn (Figure 1-3). The shoreline is comprised of rock/gravel coverage and grass brush land. The site is adjacent to the mouth of the River Deel, which enters Lough Conn to the north around a headland.

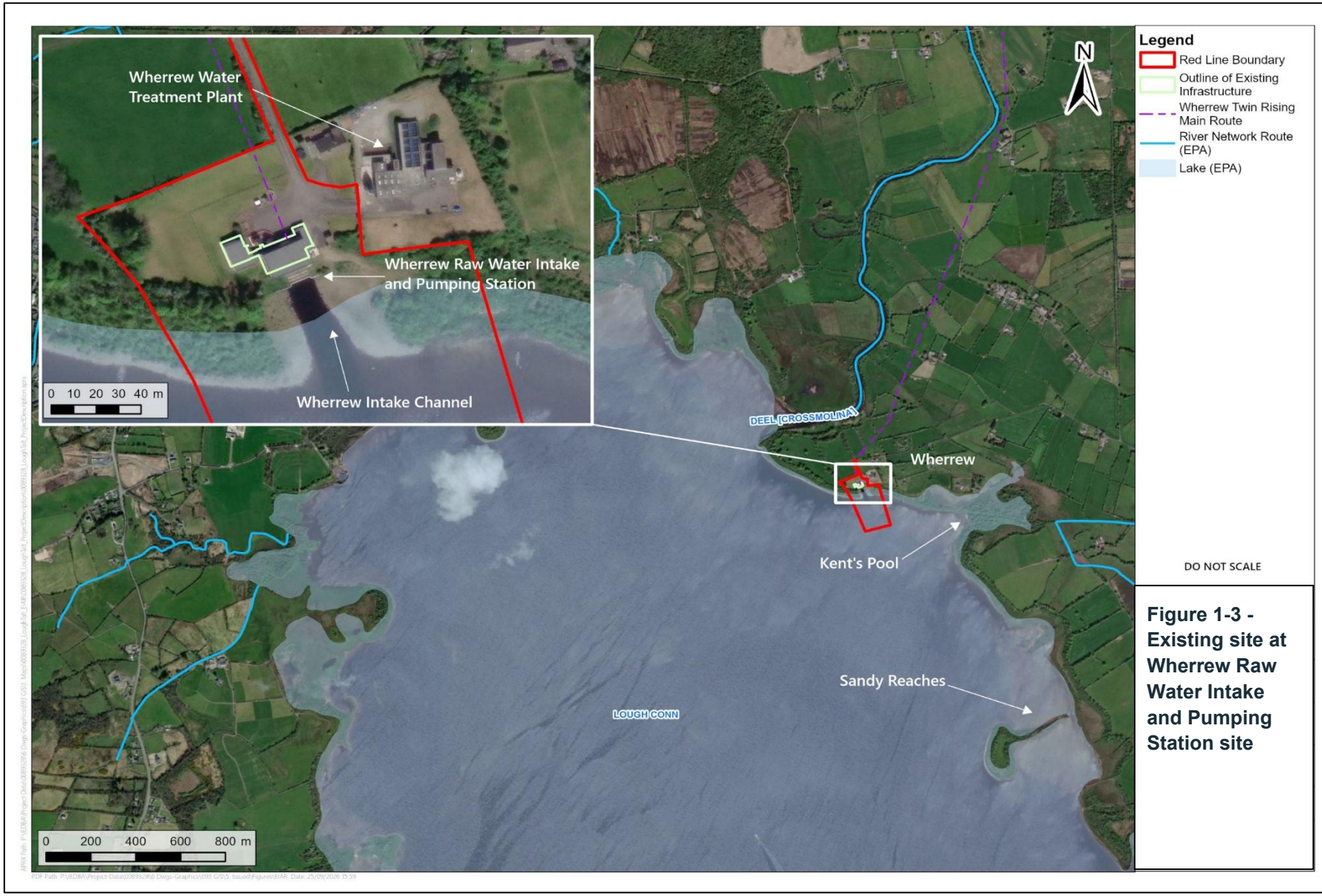



**Figure 1-3 - Existing site at Wherrew Raw Water Intake and Pumping Station site**

The existing Wherrew RWI&PS abstracts raw water and transfers to two WTPs, Wherrew WTP and Lisglennon WTP in accordance with the existing abstraction licence (Reference No. R0651-02). The existing development consists of a raw water intake channel, a raw water intake structure, raw water pumping station and transfer pipelines (Figure 1-4, and Figure 1-5).



**Figure 1-4 — Wherrew RWI&PS Site Photograph**

Key components of the existing Wherrew RWI&PS are shown in Figure 1-5 and are as follows:

- The inlet channel (approx. 50 m long, 20 m wide) was excavated from the original lakeshore, up to the intake structure (ref. no. 3, Figure 1-5). The intake channel bed is formed in natural soils / rock, with natural stone rock armour placed along the banks of the channel. The channel is approx. 2 m deep near the intake structure.
- The intake structure contains two inlet sumps (ref. no. 1, Figure 1-5), with each sump equipped with coarse and fine screens. There are penstocks in each channel to isolate individual channels and sumps for maintenance.
- The raw water pumping station building houses (ref. no. 2, Figure 1-5) designated pumps to supply Lisglennon and Wherrew WTPs independent from one another.
- Existing twin 700 mm rising mains transfer raw water to the inlet chamber at the Lisglennon RWS&PS site (approx. 11 km). A separate pipeline supplies Wherrew WTP independently.
- Welfare facilities for staff (including potable and foul water) are located in the adjacent Wherrew WTP.
- The existing electrical supply at site is 630 kVA. The site is supplied by two medium voltage (MV) transformers and one low voltage (LV) transformer.
- Existing control and telemetry systems consisting of a Motor Control Centre (MCC) and Human Machine Interface (HMI) panel located within the pumping station, enabling control of pump operation.
- There is an existing entrance gate with pedestrian access and car parking to the front of the pumping station building, and access is via the local Wherrew Road (L5111).

- Existing site drainage consists of road gullies which is connected to the existing local on-site stormwater system.

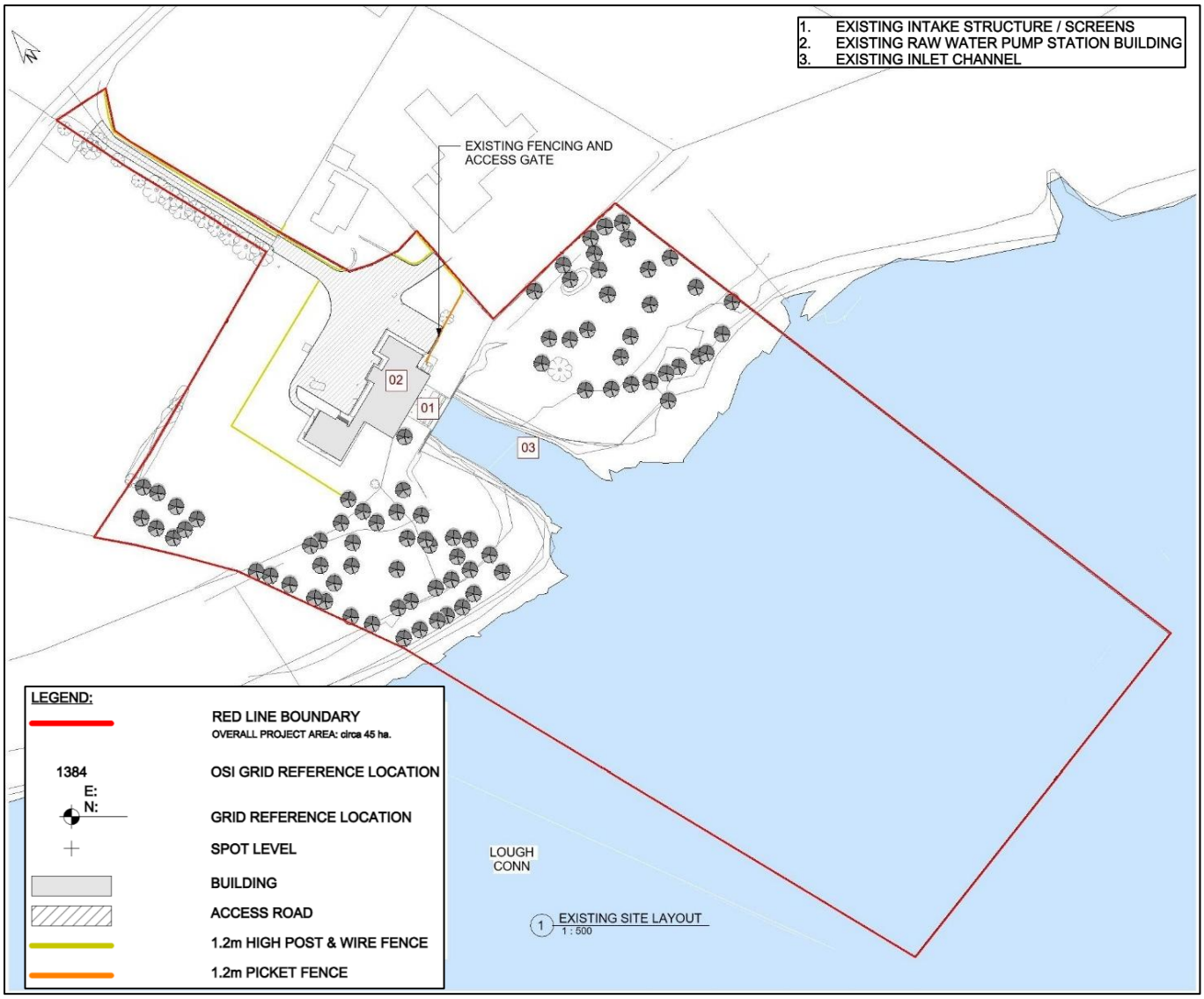



**Figure 1-5 — Wherrew RWI&PS Site – Existing Site Layout**

### 1.2.1.2 Summary of Upgrades to Wherrew Raw Water Intake & Pumping Station

The anticipated 2044 future demand is 38,120 $m^3$/day. The proposed upgrades to the existing Wherrew RWI&PS will facilitate the increased demand and address key operational issues, specifically the accumulation of silt at the intake channel and upgrade fish exclusion systems. A site layout of the proposed upgrades is provided in Figure 1-6.

The proposed upgrades include:

- A new intake pipe (approx. 165 m long, approx. 1,200 mm internal diameter) and intake screen on a precast concrete base (approx. 1.75 m by 1.75 m) (Ref. nos. 3 and 4, Figure 1-6);
- The existing intake channel will be infilled with suitable material to restore the original lakeshore profile;
- Three new cardinal markers;

- Upgrade and extension to the intake structure (Ref. nos. 5 and 9, Figure 1-6);
- Proposed fish return system with acoustic hoods (Ref. no. 11, Figure 1-6);
- Proposed pressure and flow monitoring instrumentation and associated works (Ref. no. 10, Figure 1-6);
- Upgrade of the existing MCC, including provision of an HMI panel and associated Programmable Logic Controller (PLC) modification, located within the pumping station (Ref. no. 2, Figure 1-6);
- Facility to connect a temporary generator, by providing a connection point and change over switch between existing electrical supply and temporary generator, and a concrete slab for temporary generator set down (Ref. no. 8, Figure 1-6); and,
- Ancillary site development works, including access arrangements, engineered landform, hardstanding, security/fencing, surface water (stormwater) management, site lighting, landscaping.
- Temporary works during construction include:
  - A temporary raw water abstraction arrangement; and,
  - A temporary cofferdam or equivalent temporary water-retaining structure to allow the intake structure upgrade works to be undertaken in dry conditions.

The existing 700 mm twin rising mains have sufficient capacity to accommodate the anticipated increases in abstracted water, therefore no works are proposed to these existing rising mains and they do not form part of the Proposed Development.

There are no works proposed to Wherrew WTP or the pumps which supply it, therefore Wherrew WTP does not form part of the Proposed Development.

Further details of the proposed upgrades are provided in the subsections below.

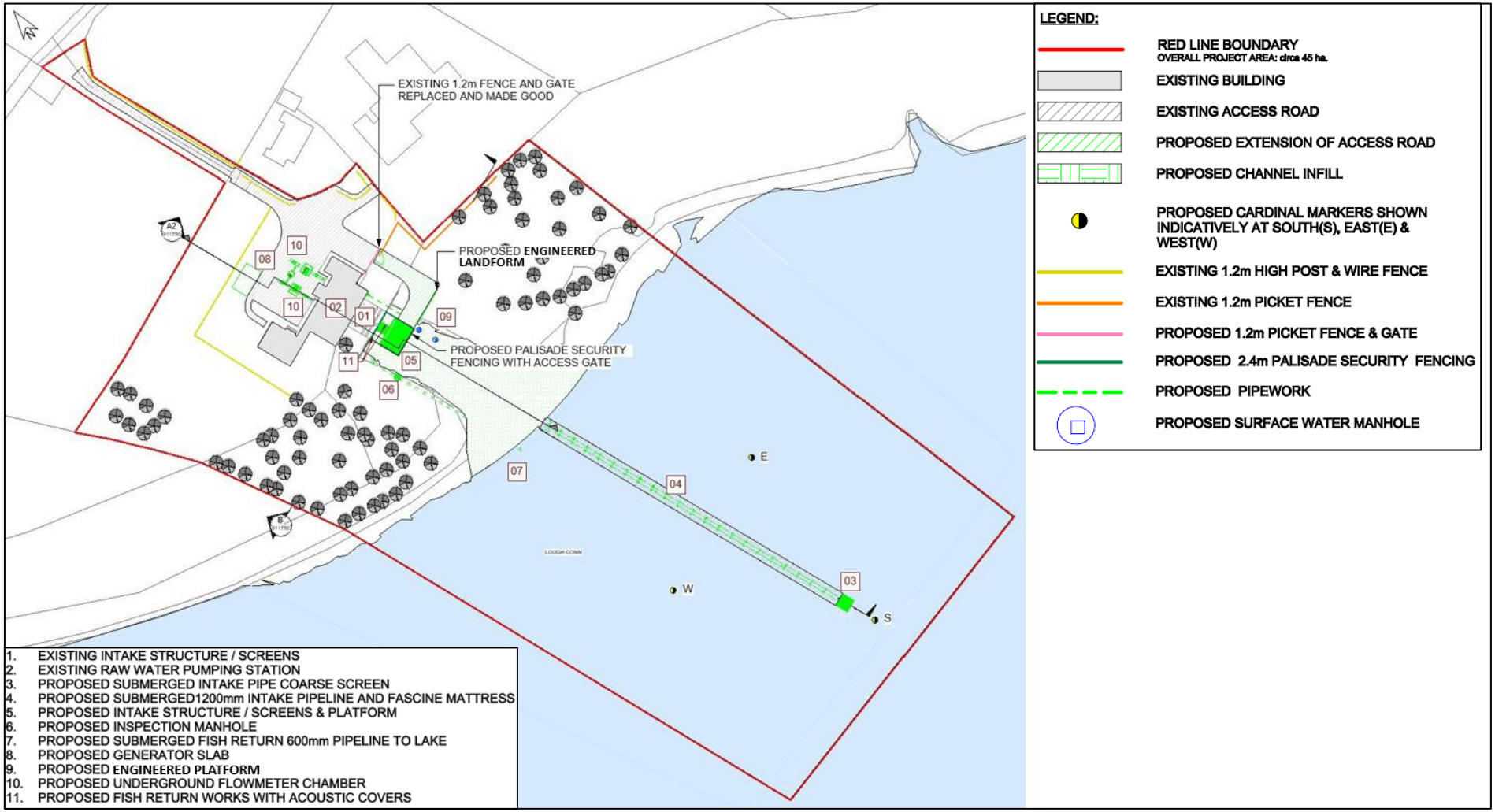



**Figure 1-6 — Wherrew RWI&PS Site – Proposed Site Layout**

An indicative visualisation of the proposed upgrades at Wherrew RWI&PS is shown in the Figure 1-7 for illustration purposes.



**Figure 1-7 — Wherrew RWI&PS Site Proposed upgrades – Visualisation (for indicative purposes only)**

#### 1.2.1.2.1 Proposed Upgrades to Intake: Intake Pipe

A new intake pipe up to 1,200 mm internal diameter is proposed to be installed in Lough Conn (Ref no. 4, Figure 1-6). This intake pipe will extend up to approx. 165 m from the existing intake structure, with approximately 110 m extending beyond the existing intake channel and into the lake, away from the local sediment deposition zone. Within the lake, the intake pipe will be protected by fascine mattressing and rock protection, with an estimated footprint of approximately 880 $m^2$, and an approx. height of 1.6 m from the lakebed. The end of the intake pipe will be protected by an intake screen with an approximate bar spacing of up to 100 mm (Ref no. 3, Figure 1-6). There are three cardinal markers proposed around the intake pipe as a precautionary measure to mark the location of the intake pipe for small crafts which may use the area.

#### 1.2.1.2.2 Proposed Intake structure and fish return system

The existing intake structure will be extended to accommodate a new inlet chamber, penstocks, fish screens and a fish return system (Ref. nos. 5 and 11, Figure 1-6). The existing intake channel will be infilled with suitable material to restore the original lakeshore profile.

The final design of the fish return system will consider best available advice and technology, however it will include the following basic design principles:

- Two rotating fish screens operating in duty / stand-by arrangement. Operation of the screens will commence in advance of pumping and will continue for a full revolution upon cessation of pumping to ensure no fish remain trapped and the screen is cleaned.;
- An acoustic hood, will be installed over the fish return system to mitigate noise during operation;
- The fish return system will include a return pipeline which will return fish safely to the lake; and,
- Cameras will be provided at Wherrew Intake to enable monitoring of the fish return.

All new and upgraded structures, equipment, and essential electrical/mechanical services within the Flood Zone A/B areas at the site will be designed and constructed to withstand flood conditions. Flood resilient design measures incorporated into the design are as follows:

- Intake structure designed to be fully submersible during flood events.
- Structural elements designed to withstand anticipated flood loading.
- Sensitive electrical and control equipment to be located either above design flood levels or outside the floodplain where practicable.
- Access, maintenance and operational procedures to be developed with consideration of flood conditions and residual risk.

#### 1.2.1.2.3 Pressure and Flow Monitoring Instrumentation

To actively monitor the raw water flow, the following works are proposed:

- Installation of pressure monitoring equipment in the raw water pumping station (Ref. no. 2, Figure 1-6); and,
- Installation of flowmeters, located within the Wherrew RWI&PS site, immediately outside of the raw water pumping station building and associated works (Ref. no. 10, Figure 1-6).

Pressure and flow monitoring equipment will be integrated into the control panel located within the raw water pumping station (MCC and HMI). These proposed upgrades will enable active monitoring, potentially improving electricity and water supply efficiency. Associated works include short pipeline sections, isolation valves, flow meter chambers and a scour chamber for flow meter installation.

#### 1.2.1.2.4 Power Supply & Renewable Energy

There is existing power supply to the site, and it is deemed sufficient for continued operation including the proposed upgrades.

Provision for emergency backup supply in the form of a temporary mobile generator is proposed to mitigate the potential disruption to the raw water supply in the event of a power outage at the Wherrew RWI&PS site. It is proposed to include a set down area, a concrete slab (ref. no. 8, Figure 1-6), for a temporary generator connection as a backup power source via mobile generating equipment, located to the west of the site. The temporary mobile generator and associated fuel will be kept off site and will be brought to site when required.

#### 1.2.1.2.5 Ancillary works

**Access**

Access and egress to site will be through the existing paved access road off the L5111, the main Wherrew access road. Within the site, the existing hardstanding areas will be retained and a new extension of the access road (up to 191 m2) will be constructed adjacent to the upgraded intake structure (Ref. no. 5, Figure 1-6) to enable access for construction and long-term operation and maintenance. The proposed access road will be raised locally using engineered fill to achieve the required road level while minimising encroachment into the adjacent channel area. The lakeward edge of the raised road will be supported by an appropriately designed earthworks and retaining system, or engineered landform, which may comprise a reinforced earth embankment, gabions, a retaining wall, or a combination of these measures. The retained edge of the engineered landform will extend for approximately 13.9 m and will have an exposed height of approximately 1.1 m to 1.8 m (Ref. No. 9, Figure 1-6). The final form will be determined during detailed design, having regard to ground conditions, structural stability, hydraulic requirements and landscape integration. As the exposed lakeward face will form a visual continuation of the upgraded intake structure, its materials, colour, texture and finish will be selected to provide a coherent appearance and respond sensitively to the local landscape setting. Where concrete is exposed, it will be finished with nap plaster, or an equivalent finish consistent with that applied to the upgraded

intake structure. A handrail will be installed along the lakeward edge. Road drainage is described in the surface water management section below.

**Fencing / Boundary**
The existing timber picket type fence and gate on the eastern side of the site will be realigned with continued pedestrian access. A new 2.4 m high palisade security fence with access gates is proposed around the new intake structure (Figure 1-6).

**Stormwater Management**
A linear slotted drain will be installed at the interface between the proposed and existing access roads to manage surface water runoff from the existing hardstanding area. This will be connected into the existing local on-site drainage network.

Surface water runoff from the proposed access road will be managed through a new surface water management system. This will comprise a linear drain, at the interface between the access road and the new intake structure, stormwater manholes, a petrol interceptor and a proposed soakaway. The proposed soakaway is located within the channel infill area and will consist of free draining stones to allow faster percolation.

**Site Lighting**
Portable lighting will be provided along the proposed access road and paths to allow for safe access to site. Wall mounted luminaires will be provided above the proposed acoustic hood enclosures. Refer to Section 1.8 for overall site lighting for the Proposed Development.

**Landscaping**
It is proposed to include soft landscaping measures such as amenity grassland, wildflower and woodland mix planting, and to salvage and reinstate disturbed areas. Additional biodiversity measures include introduction of bat boxes, bird boxes, insect boxes and hibernaculum.

The existing intake is currently located within an inlet channel which was cut into the rock. It is proposed that this channel will be filled, enabling restoration of the original lakeshore. Proposed landscaping will be matched to the existing habitat where possible, i.e. existing willow and alder scrub or woodland. The area above the buried pipes will be grassed rather than treed to maintain the integrity of the buried pipes. The shoreline will be restored as rocky shore aligned with the existing character.

#### 1.2.1.3 Construction

This section describes the likely construction sequence and methodology for the proposed works at Wherrew RWI&PS, based on the current stage of design. All works will be undertaken in accordance with construction provisions set out in Section 1.3, including the environmental controls set out in the construction management plans (Section 1.3.4).

The works will be planned and phased to maintain continuity of raw water abstraction from Lough Conn throughout the construction period, insofar as practicable. Initial activities will include site establishment, set-up of temporary working areas and site compound (see Section 1.3.6), protection of existing operational assets and services, and provision of temporary access to the intake channel and shoreline working area.

To maintain abstraction during the intake upgrade works, a temporary raw water abstraction arrangement will be installed. This is anticipated to comprise of temporary raw water intake pipes, likely polyethylene or similar, connected to the existing inlet sumps. The temporary pipes will generally be laid above ground across the site and extended into Lough Conn, where the intake ends will be supported by pontoons or equivalent floating support systems. The temporary pipework will be weighted, secured and protected, as required, to maintain

stability, prevent accidental damage and ensure safe operation during construction. The temporary intake ends will remain submerged while maintaining clearance above the lakebed. Following completion and commissioning of the permanent intake works, the temporary abstraction pipework, pontoons and associated temporary works will be removed from the lake.

Once the temporary abstraction arrangement is operational, a temporary cofferdam or equivalent temporary water-retaining structure will be installed to allow the intake structure upgrade works to be undertaken in dry conditions. The current anticipated approach is a sheet-piled cofferdam of approx. 30 linear m; however, the Appointed Contractor may adopt an equivalent temporary works solution where this achieves the same function and remains within scope of the environmental assessment. Where sheet piling is used, appropriate noise and vibration mitigation will be implemented, which may include resonance-free vibratory piling techniques, acoustic shrouds, temporary acoustic barriers, restricted working hours and vibration monitoring (see Section 1.3.4). Pile installation is anticipated to be of short duration, subject to ground conditions and the final temporary works design.

Prior to dewatering, the water within the cofferdam will be electrofished by a suitably qualified and licenced expert, and any caught fish will be returned to the lough prior to any pumping works. Water generated during dewatering of the temporary working area will be managed through settlement tanks or other appropriate treatment measures prior to controlled return to Lough Conn. Any water removed from isolated cofferdam working areas back into the lake only after it has been fully settled and is free of visible suspended solids. Untreated water will not discharge to the lough. Discharge will only occur following adequate settlement and in accordance with the environmental controls set out in the Appointed Contractor's Construction Environmental Management Plan (CEMP) (see Section 1.3.4). The works to the intake structure will be undertaken in dry conditions behind the temporary cofferdam, (or equivalent) reducing the potential for cementitious materials, hydrocarbons or other construction-related contaminants to enter the lake. Once the intake structure works are complete, the temporary cofferdam or equivalent structure will be removed in a controlled manner.

The fish return system will be installed following substantial completion of the intake structure upgrade works. A fish return pipe will be installed from the intake structure back to Lough Conn. The final alignment and discharge location will be confirmed during detailed design. Installation may require localised shallow excavation or trenching along the lakeshore to accommodate the pipe. Where excavation is required, the trench will be backfilled following installation and the affected area reinstated. Sediment prevention and control measures will be implemented throughout these works.

The new permanent intake pipe will be approximately 165 m in length and up to 1,200 mm internal diameter. The intake pipe length is required to extend beyond the existing intake channel and localised sediment deposition zone, and to reach suitable water depth within Lough Conn. Localised preparation of the lakebed will be required along the pipe alignment to provide a stable and level pipe bedding. This is anticipated to involve minor grading and levelling of a narrow strip of lakebed, approximately 1.2 m wide, using plant positioned on a barge, pontoon or similar floating platform.

The intake pipe is anticipated to be assembled onshore and launched or pulled into position using rollers, floatation devices, boats, pontoons or equivalent methods. Once floated into position, the intake pipe will be sunk onto the prepared lakebed and secured. The pipe will be protected using a suitable surround and fascine mattressing, ballasted with clean, washed stone. Stone placement will be undertaken in a controlled manner to minimise disturbance and suspended sediment generation. Along the nearshore section, stone may be placed using a long-reach excavator operating from the shoreline, where practicable. For the remaining in-lake section, stone may be transported and placed from a modular pontoon, barge or similar floating platform.

The intake screen will be installed at the lakeward end of the intake pipe. Localised lakebed preparation will be required to create a stable level formation for the screen unit. The intake screen is anticipated to comprise a

prefabricated unit, including a ductile iron pipe section and coarse screen mounted on a precast concrete base of approximately 1.75 m by 1.75 m. The unit will be lowered into position from a barge, pontoon or similar floating platform and connected to the intake pipe by divers or other suitable specialist methods.

All in-lake works will be carried out using appropriate sediment control and water quality protection measures, which may include silt curtains, silt netting or equivalent controls, where suitable to the working conditions. The detailed measures will be confirmed by the Appointed Contractor and incorporated into their CEMP, taking account of the final construction methodology, weather conditions, lake conditions and ecological constraints. Construction methodology will be agreed with the relevant stakeholders before construction. The anticipated measures to prevent or minimise increases in suspended sediments and protect water quality during construction will be implemented via environmental management plans (see Section 1.3.4).

Following installation of the permanent intake pipe, intake screen and associated infrastructure, the existing intake channel will be backfilled with suitable material and reinstated. Backfilling will be undertaken using suitable clean material, subject to geotechnical and environmental suitability, and the reinstated area will be landscaped to tie in with the adjoining shoreline. The reinstatement works will remove the existing artificial bank incision and restore the shoreline profile, insofar as practicable, to resemble adjoining undisturbed areas.

The in-lake installation works will be weather-dependent and may require extended or continuous working during specific short-duration activities, such as pipe launch, flotation, sinking, placement and connection. Any requirement for works outside normal working hours will be managed in accordance with the procedures set out in the CEMP (Section 1.3.4.1) and relevant agreements with the local authority and other stakeholders. Pre-construction surveys and confirmatory investigations will be undertaken before the in-lake works commence. These may identify localised obstructions, such as rock or other hard material, which may require removal or localised adjustment of the pipe alignment or founding level. Any such works will be undertaken within the assessed development footprint and the assessed environmental impacts set out in this report. Material generated during lakebed preparation will not be removed from Lough Conn unless required by the final construction methodology and agreed through the relevant environmental controls.

Following completion of the intake upgrade works, the remaining ancillary works at Wherrew RWI&PS will be undertaken. These will include installation of the temporary generator set-down slab, electrical ducting and flow meter chambers. The generator slab will be located within the existing car park area and is anticipated to comprise precast concrete units or equivalent. Electrical ducting will be installed between the generator connection point and the pumping station.

Flow meters will be installed downstream of the pumping station on the existing twin 700 mm rising mains within the existing car park area. The flow meters will be housed in chambers with access covers, isolation valves and associated fittings to facilitate safe operation, inspection and maintenance. Excavations will be formed to expose the existing pipelines, with sufficient working space to construct the chambers and install the flow meters. Ducting will be provided between the chambers and the pumping station to connect the flow meters to the pressure monitoring, control and telemetry systems.

On completion of the principal construction works, temporary working areas and temporary abstraction arrangements will be removed, the new access road will be completed using suitable materials, and disturbed areas will be reinstated and landscaped. The proposed works at Wherrew RWI&PS are anticipated to take approximately 6 to 7 months to complete. The works may be undertaken in stages and are not necessarily sequential. The existing Wherrew RWI&PS has sufficient capacity to meet the predicted future abstraction requirements. As such, completion of the Wherrew upgrade works is not required before abstraction from Lough Talt ceases. The construction and commissioning of the Wherrew RWI&PS upgrade works can therefore proceed independently of the other elements of the Proposed Development.

#### 1.2.1.4 Operation and Maintenance

The existing pumps at Wherrew RWI&PS currently operate for approximately 8 hours per day. Following completion of the proposed upgrades, the duration of pumping will increase in response to demand, up to a maximum operating period of approximately 22 hours per day. The pumping station will operate in a duty standby arrangement, with pump operation controlled through the existing control and telemetry systems.

The fish return system will operate in conjunction with the pumping regime. The rotating fish screens will operate in a duty/standby arrangement and will commence operation in advance of pumping, continuing for a short period following cessation of pumping to reduce the potential for fish to remain within the intake system. The system will include automatic screen washing during operation, using low and high-pressure wash systems, and the screens may therefore be cleaned several times per day depending on operational demand and raw water conditions.

Routine operation and maintenance activities will include operator attendance, daily checks and visual inspections, together with scheduled weekly, monthly and annual preventative maintenance tasks. The fish return screens will be inspected during routine operational checks, including when the relevant screen is in standby mode. Inspection and maintenance will be undertaken in accordance with Uisce Éireann operational procedures and the manufacturer's requirements for the installed equipment. An operational flood response plan will be prepared, ensuring that safe access and egress for staff can be maintained during flood events, and that any critical controls are accessible.

The in-lake intake screen will remain submerged during normal operation. As the screen will be located below the water surface and away from the existing intake channel, the potential for routine debris accumulation is expected to be reduced when compared with the existing intake arrangement. The intake screen will be inspected and cleaned as required, with routine cleaning anticipated to be undertaken approximately annually, subject to operational experience, monitoring results and raw water conditions.

Pressure and flow monitoring instrumentation will be maintained as part of the site's routine operational checks and planned preventative maintenance regime. These systems will support ongoing monitoring of abstraction rates, pump performance and system resilience.

Operational access to the site will continue via the existing Wherrew Road access. No permanent additional welfare facilities or foul drainage infrastructure are proposed at Wherrew RWI&PS as part of the upgrade works.

### 1.2.2 Lisglennon Raw Water Storage & Pumping Station

#### 1.2.2.1 Existing Lisglennon Raw Water Storage & Pumping Station Site

The existing Lisglennon RWS&PS site at Lisglennon, Ballina, Co. Mayo, is bounded to the northwest and northeast by a wire fence in addition to hedgerow and mature trees. Access to the site is from the L11109.

Raw water enters via the inlet chamber (Figure 1-8A), which functions as a break pressure tank. From there, raw water is transferred to the raw water storage tank (Figure 1-8B), then to the raw water pumping station (Figure 1-8C), as illustrated in Figure 1-9, with an aerial view shown in Figure 1-10. Currently, the raw water storage tank provides approximately 48 hours of storage. The raw water pumping station is equipped with two decommissioned pumps, two operational pumps, one surge vessel, associated pipework and a flowmeter. Raw water leaves the pumping station via an existing 300 mm internal diameter raw water pipeline serving the Lisglennon WTP. There is designated access to the PS, Reservoir and storage area/compound.




**Figure 1-8 — Lisglennon RWS&PS Site. A: Existing Inlet Chamber; B: Existing Storage Tank; C: Existing Raw Water Pumping Station, with carparking in front.**

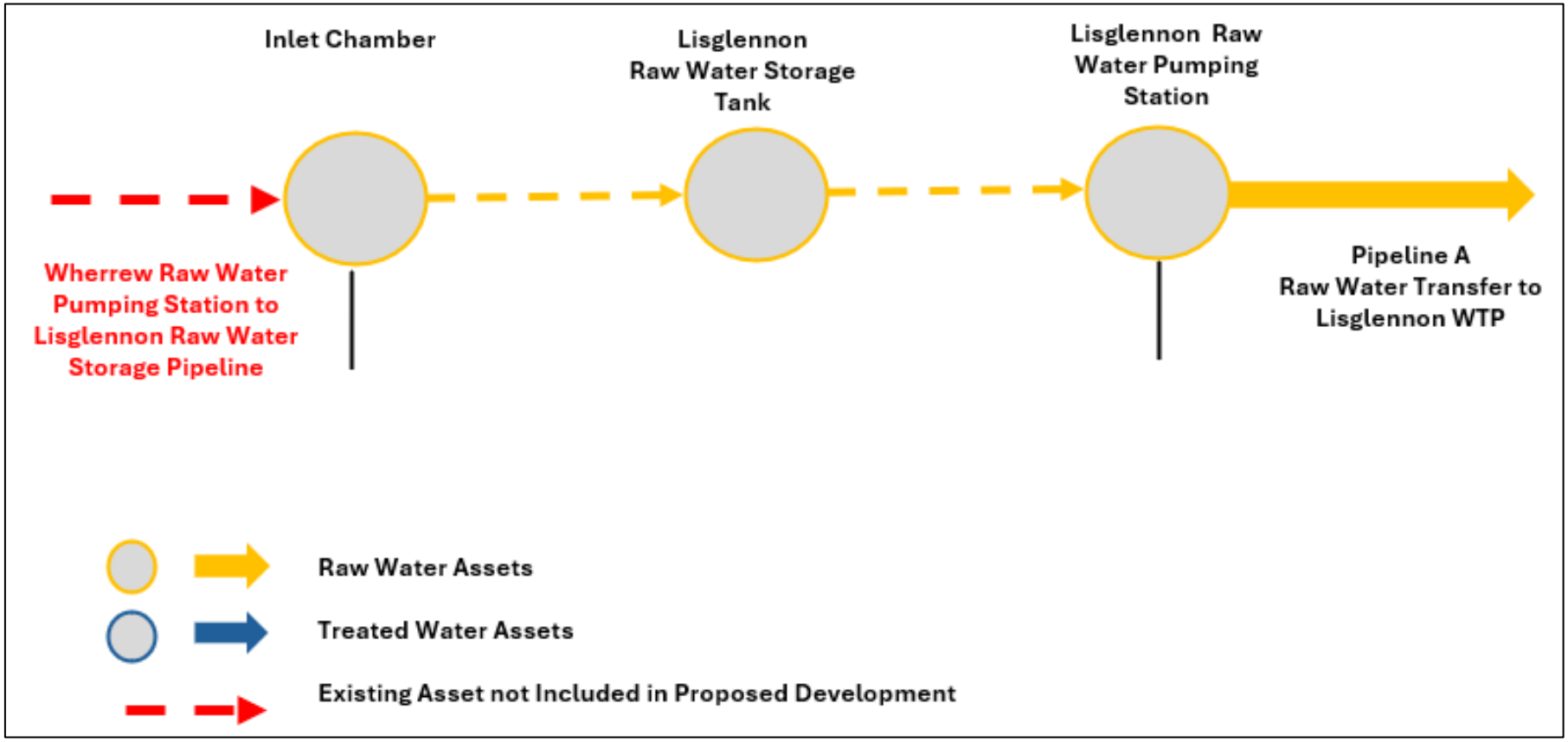



**Figure 1-9 — Schematic Overview of Lisglennon RWS&PS Site**

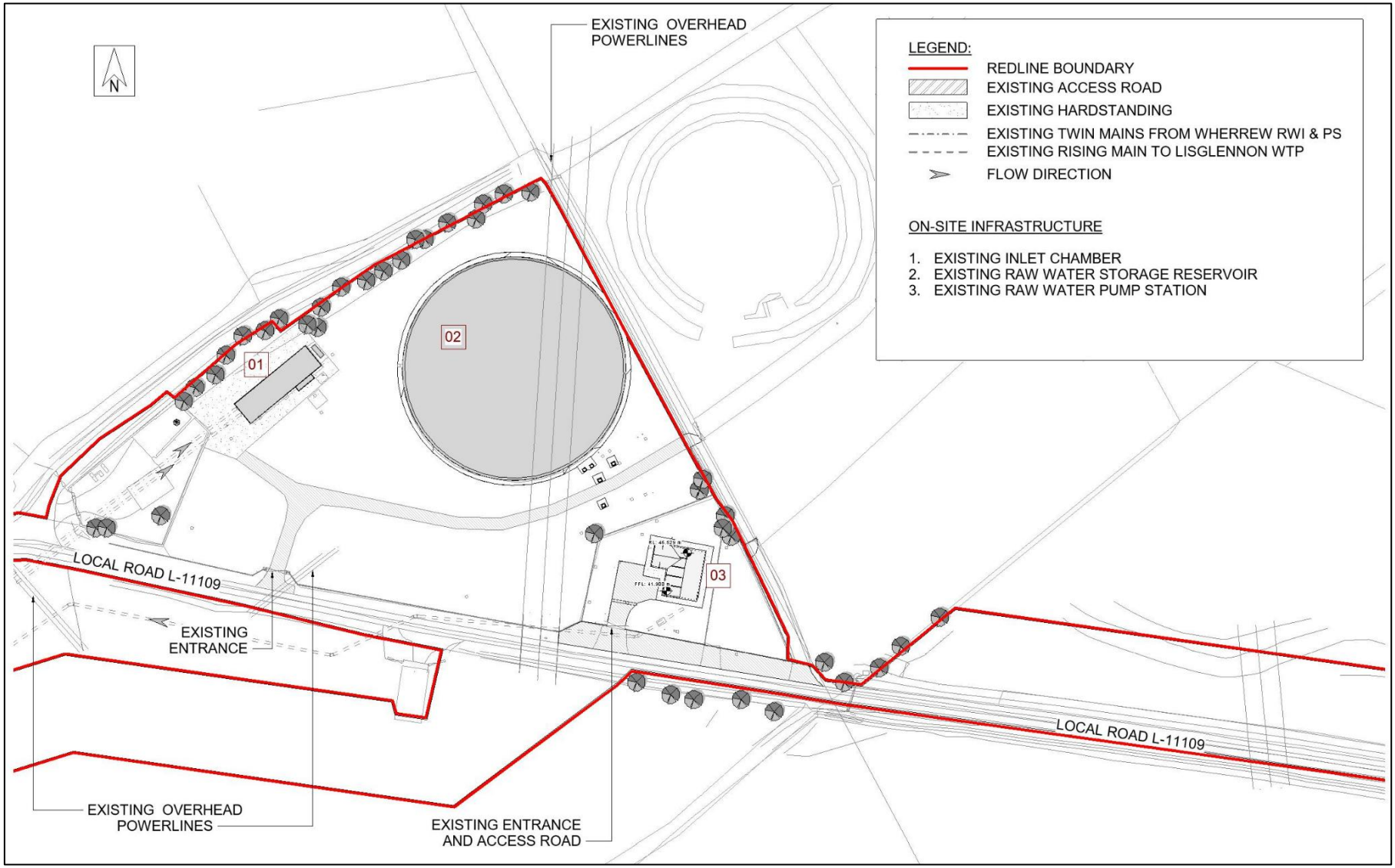



**Figure 1-10 — Lisglennon RWS&PS – Existing Site Layout**

#### 1.2.2.2 Proposed Upgrades to the Lisglennon RWS&PS Site

The following upgrades will be undertaken:

- Replacement of the existing, decommissioned pumps with two new pump sets within the pumping station;
- Replacement of the pipework and valves within the pumping station to accommodate increased future flows;
- Installation of pressure measuring instrumentation including pressure gauges and pressure transducers within the pumping station;
- Installation of new flowmeter on Pipeline A (Section 1.2.3); and
- Ancillary works, primarily located within the existing hardstanding area of the pumping station, and landscaping.

No changes are proposed to the power supply, site lighting and stormwater management. A proposed site layout is shown in Figure 1-11.

##### 1.2.2.2.1 Flowmeter installation

Installation of a flowmeter and associated works will be undertaken within the Lisglennon RWS&PS site, immediately outside of the raw water pumping station building. Associated works include short pipeline/ducting sections to connect to the pressure monitoring, control and telemetry systems (located inside the pumping station), isolation valves, flow meter chambers and access covers.

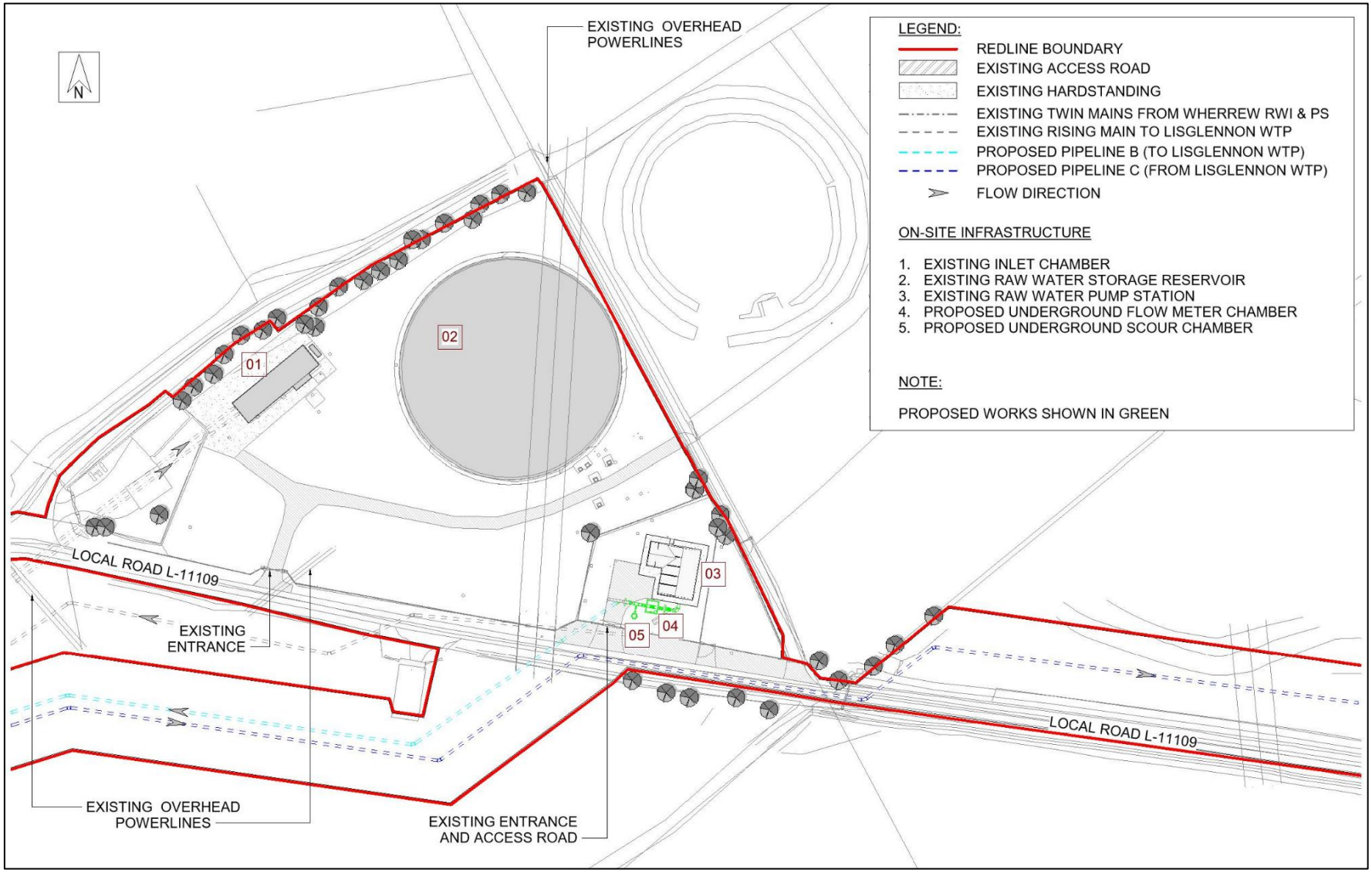



**Figure 1-11 — Lisglennon RWS&PS – Proposed Site Layout**

#### 1.2.2.2.2 Ancillary works

**Site Lighting**

Existing low level pole mounted luminaires will achieve the required lux levels for the access road, pumping station and inlet chamber. No additional site lighting is therefore proposed.

**Landscaping**

The existing treeline comprising mature ash and beech trees will be retained and unaltered. Areas of amenity grassland around the raw water storage tank will be subject to a reduced mowing regime to encourage the establishment of a wildflower area which will help attract pollinator species. New hedgerow, consisting of native species, will be planted along the southern boundary fenceline. Additional biodiversity enhancement measures include the installation of insect boxes for pollinator species and hibernacula. No bat or bird boxes are proposed due to the potential for contamination of the open raw water storage reservoir.

### 1.2.2.3 Construction

The existing decommissioned pumps together with all associated internal pipework will be replaced and ancillary works such as flowmeter chamber, scour chamber and isolation valve chamber, will be installed within the site. Following the successful installation and testing of the new pumping equipment and rising main, flows will be transferred to the upgraded system. The existing rising main will be retained for use as a bypass during maintenance activities.

### 1.2.2.4 Operational and Maintenance

The upgraded pumping station will be operated and maintained as a critical component of the raw water supply system, with a focus on reliability, efficiency, and resilience, and will continue to operate for 22-24 hours a day, with a proportional increase in response to demand achieved via additional operational pumps in accordance with the site's current operational hours. It is anticipated that the raw water storage tank will provide approximately 15 hours of storage.

Operation will be controlled through an automated system with appropriate duty/assist/standby pump configurations to respond to varying demand, supported by continuous monitoring of flows, pressures, and pump performance via the new flowmeter and instrumentation. Routine inspections and preventative maintenance will be implemented for all mechanical and electrical components, including pumps, valves, and control systems, with particular attention to wear components and standby equipment to ensure readiness. The rising main and associated chambers will be regularly inspected, including operation of isolation valves and use of scour facilities to ensure no sediment build-up.

## 1.2.3 Pipeline A – Lisglennon RWS&PS to Lisglennon WTP

### 1.2.3.1 Existing Lisglennon RWS&PS to Lisglennon WTP Rising Main

The existing 300 mm internal diameter raw water pipeline leaves Lisglennon RWS&PS, crosses the L11109, then continues off-road through private agricultural lands in the Lisglennon area before crossing beneath the L11109 and extending northwards to the Lisglennon WTP inlet chamber. The total length of the existing pipeline corridor is approximately 1 km.

### 1.2.3.2 Proposed Pipeline A – Lisglennon RWS&PS to Lisglennon WTP

Pipeline A follows the existing raw water pipeline corridor between Lisglennon RWS&PS and Lisglennon WTP, described above.

The following upgrades will be undertaken:

- A new raw water pipeline, approx. 630 mm internal diameter, will be installed parallel to the existing 300 mm raw water pipeline between Lisglennon RWS&PS and Lisglennon WTP building for a total length of approx. 1 km;
- The existing 300 mm diameter pipeline will be retained and connected to Pipeline A through strategically located cross-connections, allowing the pipeline to serve as a maintenance bypass during planned outages or maintenance activities; and,
- Ancillary pipeline infrastructure, including valves, marker posts, fittings and associated chambers, will be installed as required to facilitate the operation, maintenance and identification of Pipeline A.

No watercourse crossings or other connections have been identified as being required along the route of Pipeline A. An aerial view of the location of Pipeline A is provided in Figure 1-12 showing existing and proposed elements.

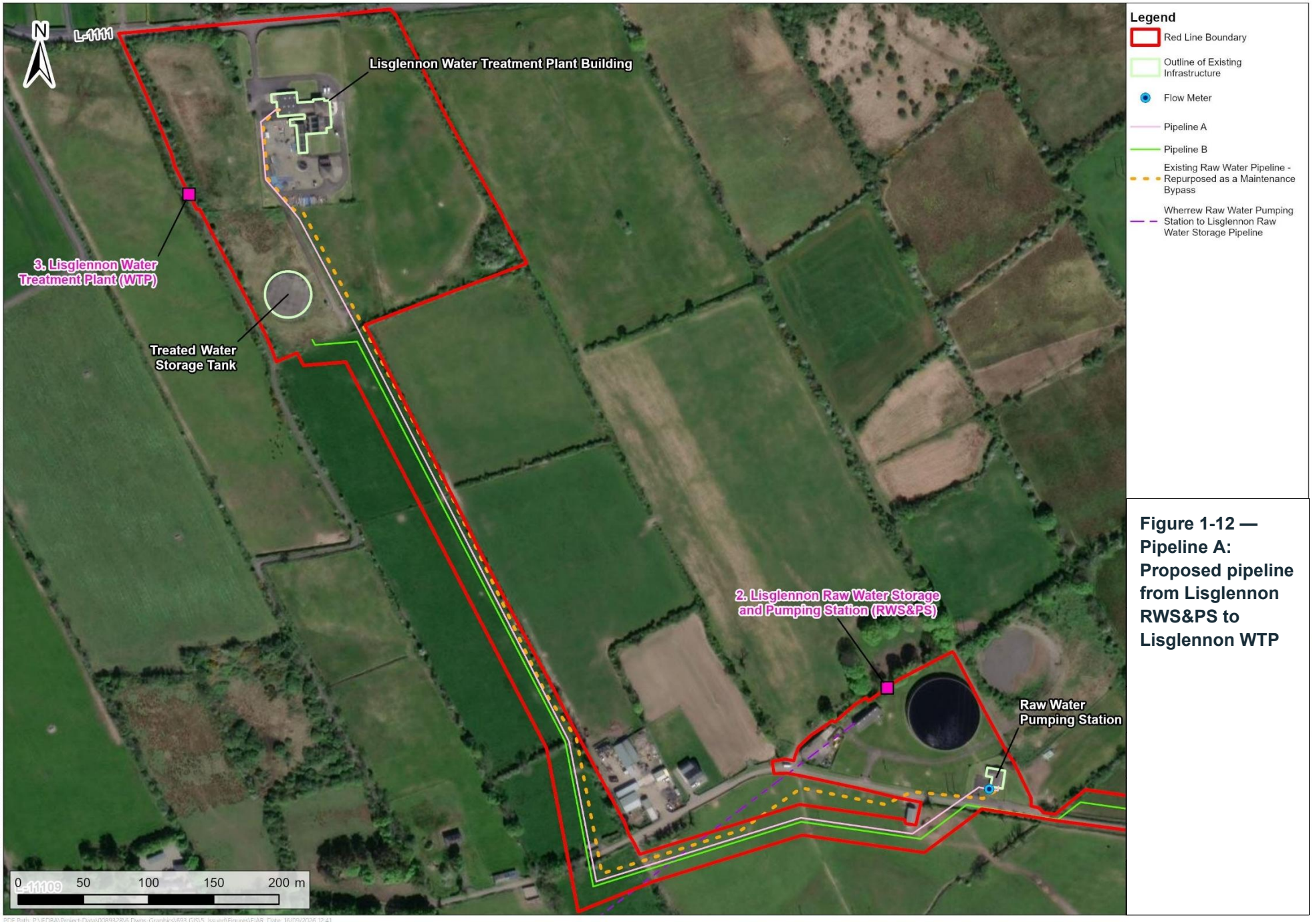



**Figure 1-12 — Pipeline A: Proposed pipeline from Lisglennon RWS&PS to Lisglennon WTP**

#### 1.2.3.3 Construction

Pipeline A and the initial section of Pipeline B, as described in Section 1.2.5, will be installed in parallel within a common trench between the treated water storage tank at Lisglennon WTP and the site access to Lisglennon RWS&PS on the L11109. The pipelines will be installed using conventional open-cut techniques. Based on current ground investigation information, trench depths are anticipated to range from approximately 1.5 m to 3.5 m, subject to detailed design and confirmatory site investigations. A granular bedding layer, anticipated to be approximately 300 mm thick, will be placed at the base of the trench prior to pipe installation. The pipes will then be laid in sections, jointed and surrounded with suitable granular pipe surround material, including material placed between the pipes and above the pipe crowns for protection. The remaining trench will be backfilled using suitable material and reinstated. Within agricultural lands, suitable excavated material will be re-used as backfill above the granular pipe surround where practicable, subject to geotechnical suitability and environmental testing. Where the pipeline is installed within public roads, reinstatement will include suitable engineered backfill, including cement bound granular material where required. A project-level summary of excavated materials is provided in Section 1.6.

Existing field drains, roadside drains or agricultural drainage features that intersect the construction working width will be identified and recorded before works commence. Drainage will be maintained during construction through temporary culverting, diversion, over-pumping or other suitable measures, where required. Any drains affected by the works will be reinstated following pipeline installation to maintain existing drainage function. Where necessary, pre-construction field drainage measures will be installed to maintain existing drainage patterns during construction. No crossings requiring trenchless installation methods are currently anticipated along Pipeline A. A Cultural Heritage feature, CH54, is identified in close proximity to the route. Environmental mitigation and protection measures relating to cultural heritage features will be implemented as set out in the CEMP (Section 1.3.4).

The Appointed Contractor will carry out a detailed site survey in advance of construction to confirm final trench dimensions along the length of the pipeline route, as well as final crossing techniques. For alternative installation methods, please see Section 1.2.5.

#### 1.2.3.4 Operation and Maintenance

Pipeline A will be inspected and maintained as required during operation. Maintenance activities are expected to be limited and will generally relate to routine inspection of valves, chambers, fittings and marker posts, together with any reactive maintenance required to maintain the integrity and performance of the pipeline. The retained existing pipeline will provide operational flexibility and may be used as a bypass during maintenance activities, where required. Project-level scour management is set out in Section 1.9.

### 1.2.4 Lisglennon Water Treatment Plant

#### 1.2.4.1 Overview of Existing Lisglennon WTP Site

Lisglennon WTP is an existing operational water treatment plant located at Lisglennon, Killala, Co. Mayo. The site comprises a part single-storey and part two-storey treatment building, associated treatment infrastructure, treated water storage, access roads, hardstanding and ancillary operational areas. The WTP is set back from the adjoining L1111 road and is contained within a defined operational site boundary.

The front of the site is bounded by an approximately 1.5 m high stone wall, with fencing along the side boundaries and approximately 2 m high fencing and gates enclosing the rear of the site. Access is provided via an existing splayed entrance from the L1111 road, which connects to internal access roads and operational

hardstanding areas within the site. A landscaped lawn area is located to the front of the main treatment building, while the treated water storage reservoir is located in the south-western portion of the site.

The site is situated within a predominantly rural and agricultural setting. Agricultural lands adjoin the site to the west, east and south. The wider surrounding area includes rural residential properties, agricultural lands, quarrying activity approximately 800 m to the west, and Killala Business Park, including Tawnaghmore Power Station, to the northwest. The nearest residential receptors are located to the north of the WTP site. Mullafarry Presbyterian Church is also located to the north of the site and is listed on the National Inventory of Architectural Heritage as being of regional significance due to its architectural, artistic, historical and social interest.



**Figure 1-13 — Existing Lisglennon WTP – Southeast view from access road**



**Figure 1-14 — Existing Lisglennon WTP –Water treatment plant**

The existing Lisglennon WTP comprises a number of civil, process, mechanical, electrical and ancillary assets that support the treatment, storage and distribution of treated water. The principal existing infrastructure includes the main treatment plant building (Ref. No. 1, Figure 1-15), which accommodates offices, laboratory facilities, welfare areas, chemical dosing rooms and process galleries.

The existing treatment infrastructure includes a coagulation and flocculation tank (Ref. No. 2, Figure 1-15), three clarification tanks (Ref. No. 3, Figure 1-15), three rapid gravity filters (Ref. No. 4, Figure 1-15), a clear water tank (located underground) and a treated water storage reservoir (Ref. No. 7, Figure 1-15). Residuals generated from the treatment process are managed through existing residuals management infrastructure, including a supernatant balancing tank, picket fence thickener (Ref. No. 5, Figure 1-15), sludge sump and plate press located within the sludge dewatering building (Ref. No. 6, Figure 1-15).

Existing chemical storage and dosing systems are provided for disinfection, pH correction and fluoridation (Ref. Nos. 8, 9 and 10, Figure 1-15). The site also includes ancillary infrastructure, including internal access roads, hardstanding, site drainage, utility connections and an existing septic tank serving welfare facilities. The layout of the existing site is shown in Figure 1-15.

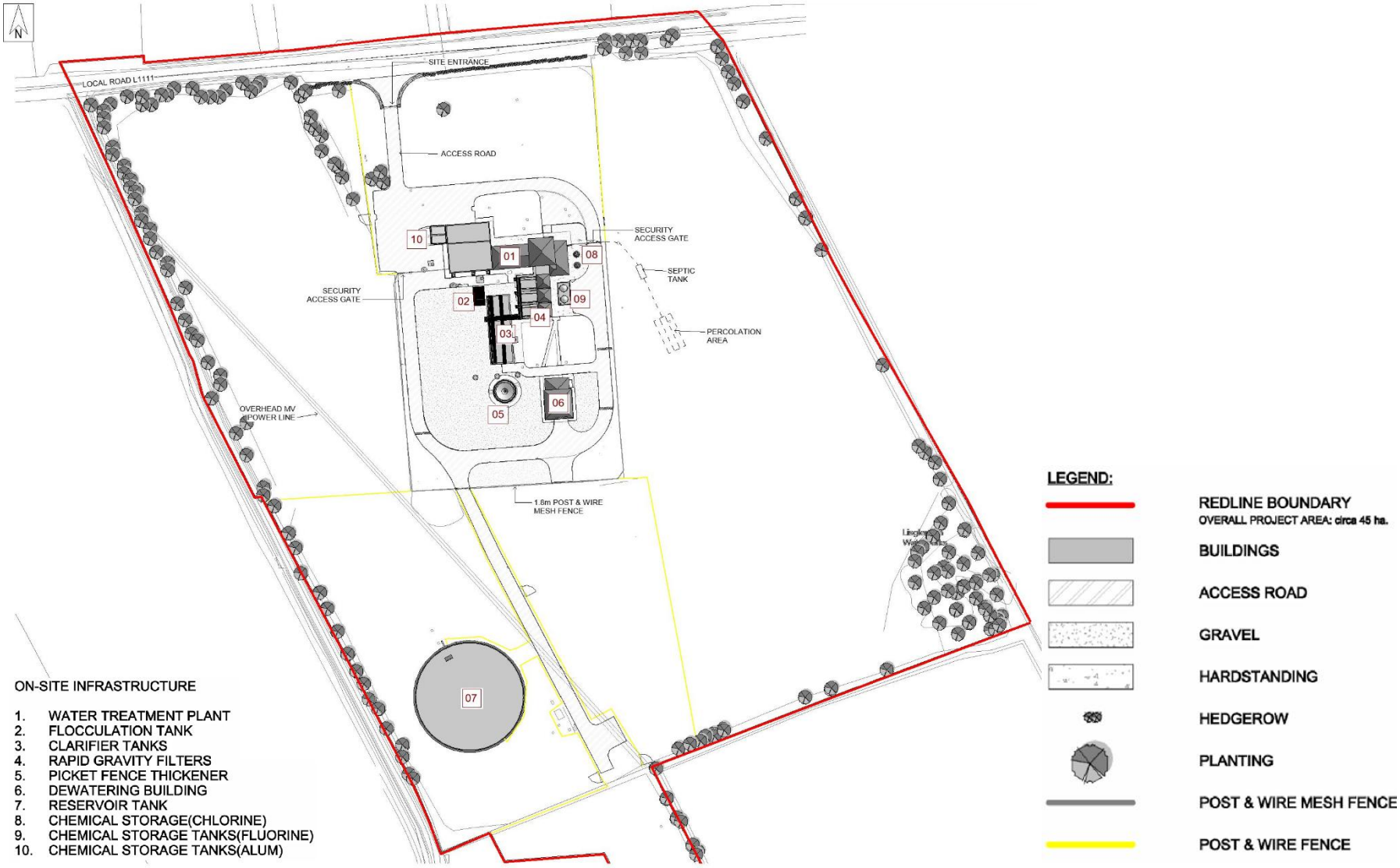



**Figure 1-15 — Existing Lisglennon WTP General Arrangement**

#### 1.2.4.1.1 Existing Treatment Process Overview

The existing Lisglennon WTP treats raw water abstracted from Lough Conn and transferred to the site via the Lisglennon raw water system (i.e. infrastructure involved in pumping water from Lough Conn through the Wherrew RWI&PS, raw water mains and Lisglennon RWS&PS).

Raw water enters the WTP via the existing raw water pipeline and is chemically conditioned to promote coagulation with aluminium sulphate. Coagulation is followed by flocculation, where controlled mixing and addition of polymer promotes the formation of larger floc particles in the mixing tank (Ref. No. 2, Figure 1-15).

The flocculated water then passes forward to clarification, where suspended solids and associated floc are settled and removed from the water stream via three clarifiers (Ref. No. 3, Figure 1-15). Each clarifier is equipped with sludge collection systems that transfer settled sludge to a common collection channel.

Clarified water is conveyed to the three existing rapid gravity filters (Ref. No. 4, Figure 1-15), where remaining particulate matter is removed through filtration. Filtered water is then transferred to the treated water system and clear water tank, where disinfection and final water conditioning are undertaken. Primary disinfection is achieved through sodium hypochlorite dosing within the treated water pipeline upstream of the treated water storage reservoir (Ref. No. 7, Figure 1-15). Fluoridation (provided through the dosing of fluorosilicic acid) and pH correction (soda ash dosing) are provided as part of the final treated water conditioning process. Treated water is then conveyed to the on-site treated water storage reservoir (Ref. No. 7, Figure 1-15), which has an approximate capacity of 4,500 $m^3$ and provides storage and operational balancing for the supply network.

Residuals generated through the treatment process comprise settled solids from the clarification stage and used filter backwash water from the rapid gravity filters. These residual streams are collected and conveyed to the residuals management system for settlement, thickening, storage and dewatering (becoming sludge). Sludge conditioning is undertaken through the dosing of polyelectrolyte prior to treatment within the picket fence thickener (Ref. No. 1, Figure 1-15), where solids are consolidated. Thickened sludge is then conveyed to a sludge storage sump located within the sludge dewatering building. From the storage sump, sludge is transferred to a mechanical dewatering system (plate press) located within the dewatering building. Supernatant arising from the residuals management process is returned to the head of the treatment process, where appropriate.

Dewatered, thickened sludge is stored securely on site prior to removal by a licensed waste contractor. It is transported to an appropriately authorised facility for treatment and recovery, with beneficial re-use prioritised where practicable in line with circular economy principles, regulatory requirements and Uisce Éireann's residuals management approach.

Bulk chemical storage for the existing Lisglennon WTP is located externally adjacent to the WTP building, with associated day tanks and dosing equipment provided internally within dedicated chemical dosing areas. Existing chemical dosing systems include aluminium sulphate dosing for coagulation, sodium hypochlorite dosing for primary disinfection, fluorosilicic acid dosing for fluoridation, soda ash dosing for pH correction and polymer for sludge thickening.

The existing treatment process is illustrated in Figure 1-16.

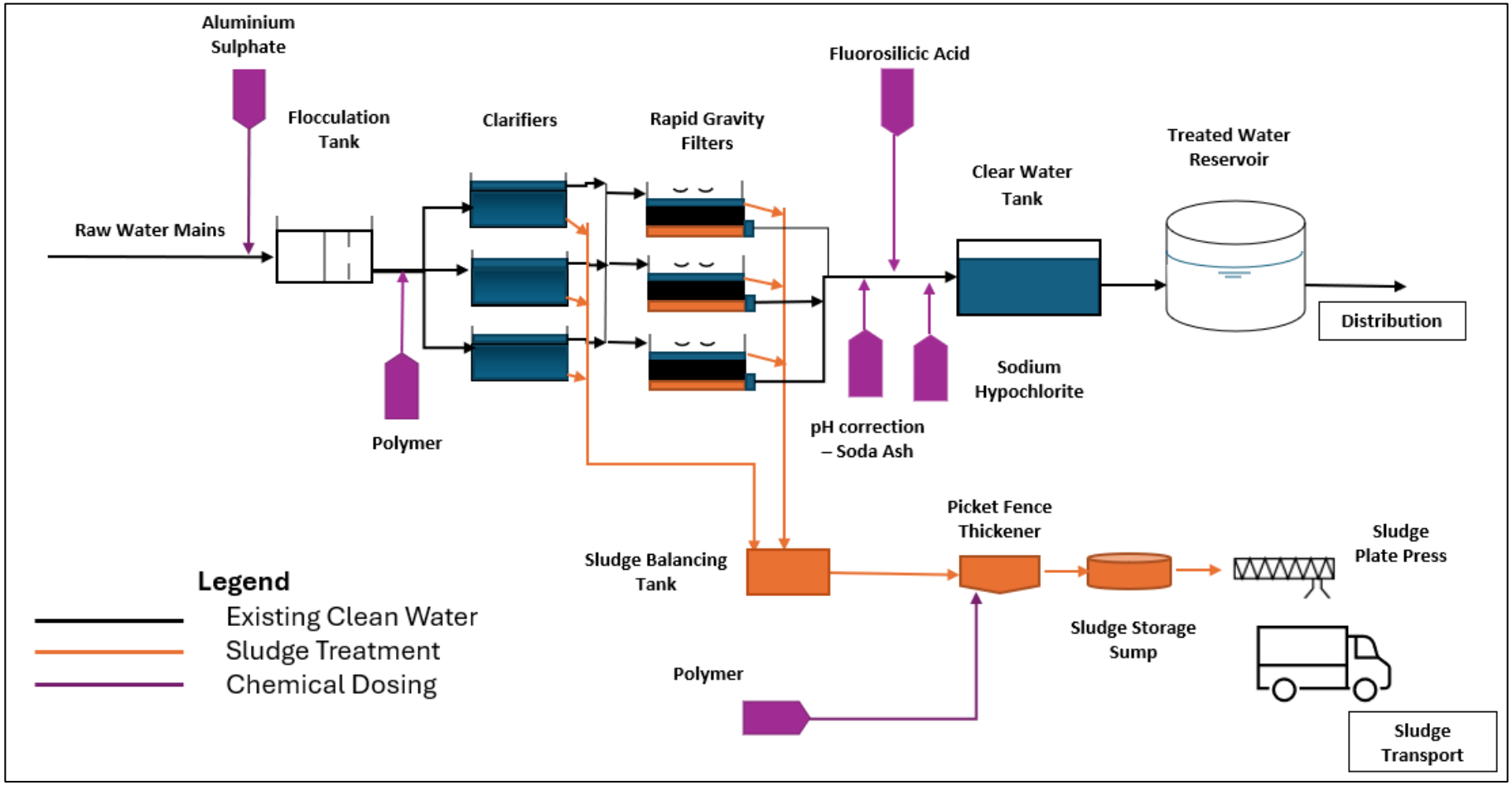



**Figure 1-16 — Flow chart of existing water treatment process**

### 1.2.4.2 Proposed Upgrades to Lisglennon WTP

Lisglennon WTP will be upgraded to provide increased treatment capacity, improved process resilience and enhanced operational control within the existing WTP site. The proposed upgrades will integrate retained existing assets with new treatment, storage, chemical dosing, residuals management, mechanical, electrical, instrumentation, control and automation infrastructure. The upgraded WTP will support the transfer of treated water to the wider Ballina and Lough Talt supply areas and will be operated in accordance with Uisce Éireann requirements for drinking water quality, asset resilience, health and safety, environmental protection and maintainability.

The proposed upgrades have been developed to provide a robust treatment process for the raw water supply from Lough Conn, with additional treatment stages, increased process redundancy, enhanced treated water storage and upgraded residuals handling.

The proposed works at Lisglennon WTP will include:

- Construction of new and upgraded coagulation, flocculation and clarification infrastructure;
- Provision of additional rapid gravity filtration capacity;
- Introduction of granular activated carbon filtration as a secondary filtration stage;
- Construction of a new treated water storage reservoir, to operate in conjunction with the retained existing treated water reservoir;
- Construction of new residuals management infrastructure, including washwater equalisation, washwater settlement, sludge balancing, sludge holding and dewatering facilities;
- Provision of new process buildings, including filter gallery buildings, soda ash dosing building, pump station and UV building, and sludge dewatering building;
- Provision of new electrical infrastructure, including an ESB medium voltage substation, control systems, telemetry and associated ducting;
- Provision of solar PV infrastructure to supplement site power demand;
- Ancillary works, including:
  - upgrades to internal access roads, hardstanding, drainage, fencing, lighting and site security;
  - decommission of the existing septic tank and its replacement with new wastewater treatment system with percolation area; and,
  - landscaping.

Changes to the treatment process includes:

- Provision of new chlorine contact tanks and associated disinfection infrastructure;
- Upgrades to pH correction, alkalinity correction, fluoridation and chemical dosing systems;
- Enhanced coagulation, flocculation and clarification capacity;
- Increasing primary filtration (Rapid Gravity Filtration (RGF)) capacity;
- Introducing second stage filtration through Granular Activated Carbon (GAC) filters;
- Increasing disinfection capacity;
- Increasing pH correction capacity of the final treated water;
- Increasing treated water storage capacity; and,
- Increasing residual management capacity.

The proposed site layout is shown in Figure 1-17. Upgrade of the Lisglennon WTP will include new infrastructure, repurposing of existing infrastructure and ancillary works, as follows:

- Retained and upgraded infrastructure:
  - Existing WTP (Ref. No. 1, Figure 1-17);
  - Upgrades to existing flocculation tank (Ref. No. 2, Figure 1-17);
  - Existing clarifier tanks (Ref. No. 5, Figure 1-17);
  - Existing rapid gravity filters and building (Ref. No. 7, Figure 1-17);
  - Existing reservoir tank (Ref. No. 15, Figure 1-17);
  - Existing dewatering building (Ref. No. 18, Figure 1-17);
  - Existing picket fence thickener (Ref. No. 23, Figure 1-17); and,
  - Existing chemical storage tanks – fluorine (Ref. No. 24, Figure 1-17).
- New structures
  - Proposed flash mixing tank ((Ref. No. 3, Figure 1-17);
  - Proposed new flocculation tank (Ref. No. 4, Figure 1-17);
  - Proposed clarifier tanks (Ref. No. 6, Figure 1-17);
  - Proposed rapid gravity filters and building (Ref. No. 8, Figure 1-17)
  - Proposed clear water tank (Ref. No. 9, Figure 1-17);
  - Proposed pumping station and future UV building (Ref. No. 10, Figure 1-17);
  - Proposed GAC filters and building (Ref. No. 11, Figure 1-17);
  - Proposed soda ash and dosing building (Ref. No. 12, Figure 1-17);
  - Proposed chlorine contact tank (Ref. No. 13, Figure 1-17);
  - Proposed reservoir tank (Ref. No. 14, Figure 1-17);
  - Proposed used washwater equalisation tank (Ref. No. 16, Figure 1-17);
  - Proposed used washwater settlement tank (Ref. No. 17, Figure 1-17);
  - Proposed filtrate and supernatant return pumping stations, inside existing dewatering building (Ref. No. 18, Figure 1-17)
  - Proposed dewatering building (Ref. No. 19, Figure 1-17);
  - Proposed sludge pumping station (Ref. No. 20, Figure 1-17);
  - Proposed sludge balancing tank (Ref. No. 21, Figure 1-17);
  - Proposed sludge holding tank (Ref. No. 22, Figure 1-17);
  - Proposed chemical storage tanks – 1 no. New tank and 2 no. replacements of existing sodium hypochlorite bulk storage (Ref. No. 25, Figure 1-17);
  - Proposed chemical storage tanks – alum (Ref. No. 26, Figure 1-17);
  - Proposed chemical storage tanks – sulphuric acid (in repurposed alum tanks) (Ref. No. 27, Figure 1-17);
  - Proposed drain down pumping station and storage tank (Ref. No. 28, Figure 1-17);
  - Proposed waste water service return pumping station (Ref. No. 29, Figure 1-17);
  - Proposed waste water treatment system and percolation area (Ref. No. 30, Figure 1-17);
  - Proposed ESB MV substation building (Ref. No. 31, Figure 1-17);
  - Temporary generator plinth (Ref. No. 32, Figure 1-17);
  - Temporary mobile dewatering unit setdown area (Ref. No. 33, Figure 1-17);
  - Proposed weigh bridge (Ref. No. 34, Figure 1-17);

- Decommissioning of the existing septic tank and its replacement with new wastewater treatment system with percolation area;
- Installation of solar panels; and,
- Ancillary site development works, including upgrades to internal access roads, temporary generator plinth, mobile dewatering unit setdown area, weighbridge, hardstanding, drainage, fencing, lighting, site security and landscaping.

A 3D isometric site layout showing existing and new structures is shown in Figure 1-18.




**Figure 1-17 — Lisglennon WTP – Proposed Site Layout (new and upgraded elements in green)**

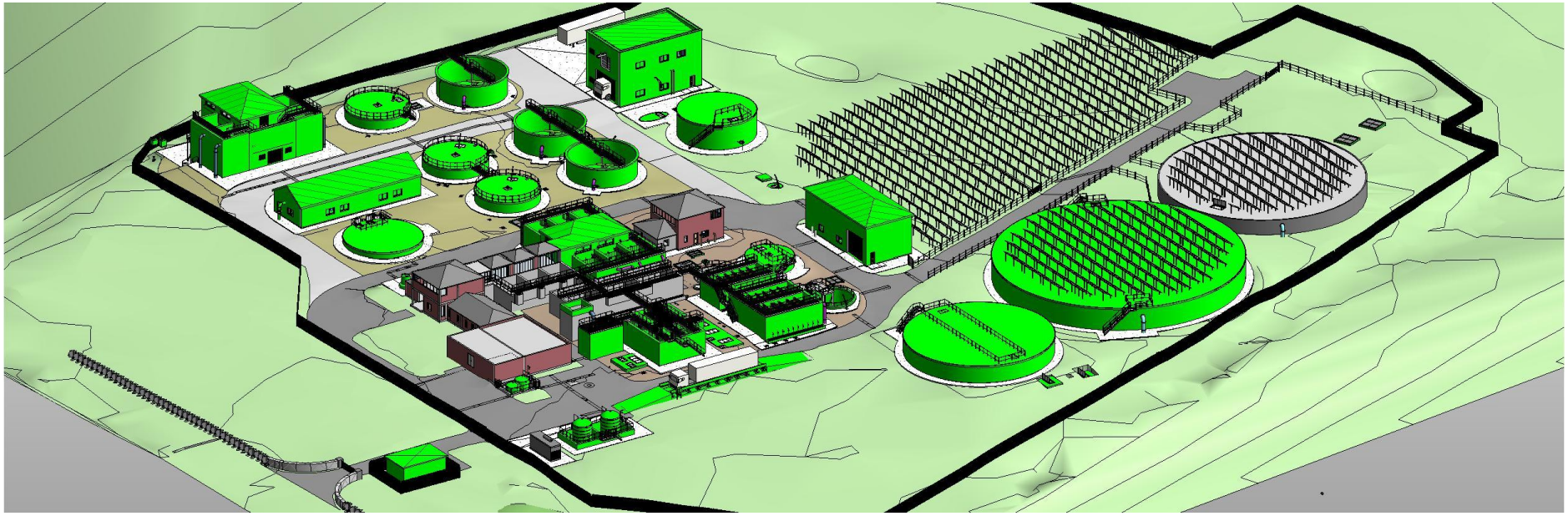


**Figure 1-18 — Lisglennon WTP site layout showing existing and new structures**

In terms of buildings, a summary is provided in Table 1-1.

**Table 1-1 — Summary of new buildings.**

| Ref. No.* | Structure | Height / storeys | Approx. Footprint ($m^2$) |
|---|---|---|---|
| 8 | New Rapid Gravity Filter | Two storey with entrance on mezzanine | |
| | | Filter Gallery | 103 |
| | | Viewing Gallery | 93 |
| 10 | New Pumping Station and UV building | Single-storey | 180 |
| 11 | New GAC Filter | Two storey with entrance on mezzanine | |
| | | Filter Gallery | 120 |
| | | Viewing Gallery | 120 |
| 12 | New Soda Ash Dosing building | Single storey with basement | |
| | | Entrance Level | 91 |
| | | Lower Level | 62 |
| 19 | New Dewatering building | Two-storey | |
| | | Ground Floor | 153 |
| | | First Floor | 153 |
| 31 | New ESB MV Substation | Single-storey | 35 |

* Reference numbers correspond to Figure 1-17.

#### 1.2.4.2.1 Proposed Process Summary

Raw water will enter Lisglennon WTP via Pipeline A and will be directed to the upgraded coagulation and flocculation stage. The existing mixing tank will be retained and supplemented by two new flocculation tanks. Chemical dosing, alum sulphate and sulphuric acid to optimise coagulation and pH correction respectively, will be provided downstream of the existing mixing tank.

Polymer dosing will be provided at the new flocculation tanks.

Following flocculation, flow will be conveyed to the clarification stage. The three existing clarifiers will be retained and supplemented by three new clarifiers, providing additional clarification capacity and process resilience. Clarified water will then be conveyed forward to the filtration stage.

The three existing rapid gravity filters will be retained and supplemented by six new rapid gravity filters. The rapid gravity filters will provide primary filtration.

The next step is Granular Activated Carbon (GAC) filtration, providing additional treatment resilience as the new secondary filtration stage. This secondary filtration stage can be bypassed (via the GAC bypass route). Water will then be transferred to a new clear water tank.

**Proposed Treated Water System**

Following transfer from the clear water tank, primary disinfection and final treated water conditioning will be applied prior to the new chlorine contact tank. This will include sodium hypochlorite dosing for disinfection

(existing, with one additional bulk storage tank and replacement of existing bulk storage tanks), fluoridation (existing system), and pH/alkalinity correction using soda ash. The chlorine contact tank will provide the required disinfection contact time before treated water is conveyed to on-site treated water storage. A new UV building will be constructed for future inclusion of UV disinfection infrastructure to be added to the treatment process.

The existing treated water storage reservoir will be retained and supplemented by a new treated water storage reservoir. The new and retained reservoirs will provide increased treated water storage and operational balancing capacity. Treated water will then leave Lisglennon WTP for distribution through the proposed treated water pipeline system.

A flow diagram setting out the upgraded treatment process is provided in Figure 1-19 and summarised below.

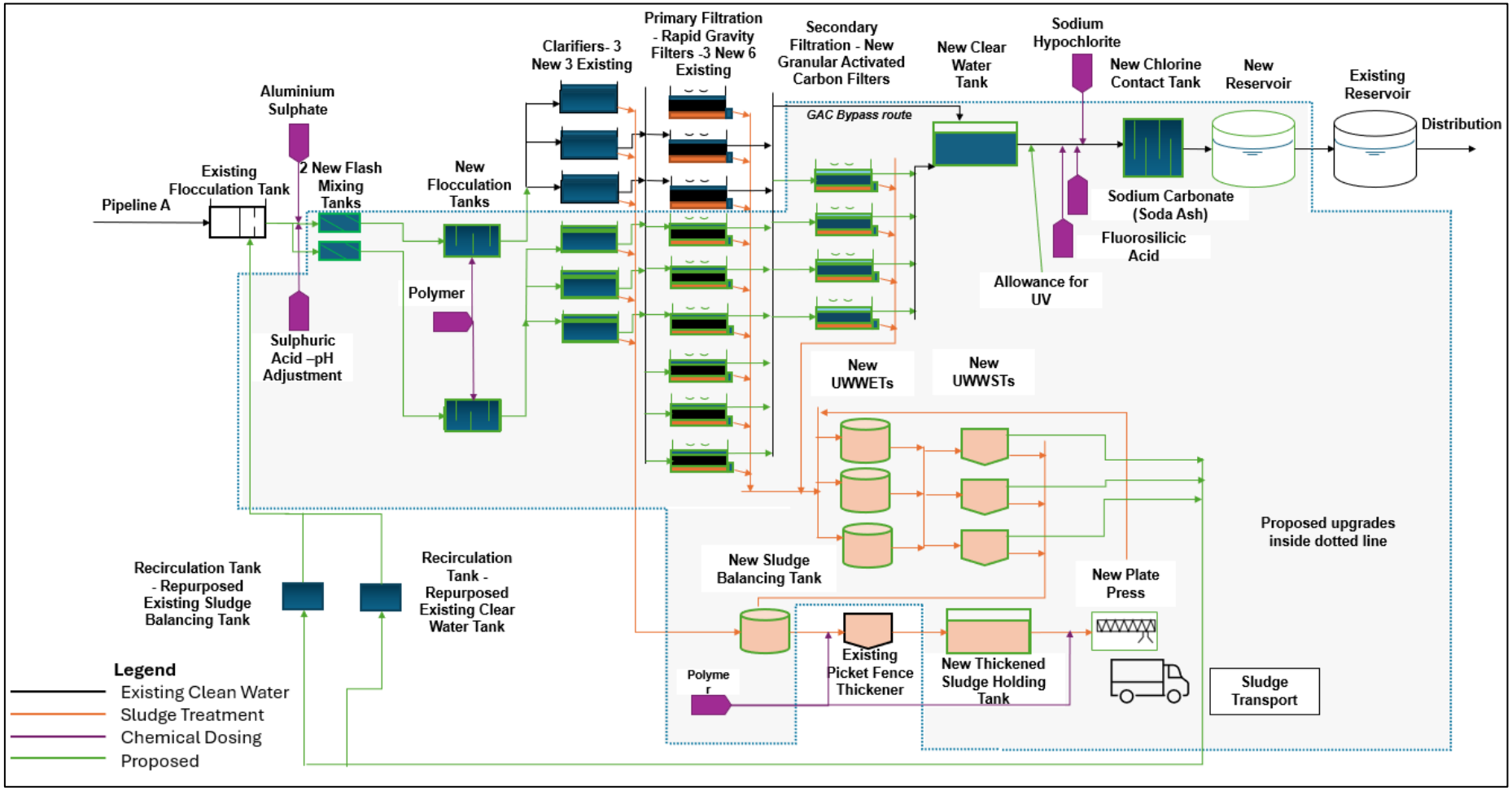



**Figure 1-19 — Lisglennon Water Treatment Plant Process Flow Diagram, with all inside the blue dotted line showing the proposed upgrades.**

A summary of new and retained assets is set out in Table 1-2, Table 1-3 and Table 1-4.

**Table 1-2 — Summary of proposed and retained Lisglennon WTP Assets**

| Ref. no.* | Asset | Retained / Proposed | No. Units | Area ($m^2$) | Unit Volume ($m^3$) |
|---|---|---|---|---|---|
| 2 | Flocculation tank (upgraded) | Retained | 1 | 6.5 | 34 |
| 3 | Flash mixing tank | New | 2 | 6.25 | 19 |
| 4 | Flocculation tank cell | New | 1 | 54.63 | 311 |
| 4 | Flocculation tank cell | New | 1 | 40.38 | 230 |
| 5 | Clarification tank | Retained | 3 | 33.28 | 146 |
| 6 | Clarification tank | New | 3 | 53 | 233 |
| 7 | Primary Rapid Gravity Filtration tank | Retained | 3 | 17.49 | 63 |
| 8 | Primary Rapid Gravity Filtration tank | New | 6 | 21.6 | 79 |
| 9 | Clear water Tank (Backwash Tank) | New | 1 | 132.7 | 400 |
| 11 | Granular Activated Carbon filter | New | 4 | 15 | 53 |
| 13 | Chlorine Contact Tank | New | 1 | 492.5 | 1,230 |
| 14 | Treated water Storage Reservoir | New | 1 | 3482.52 | 6,800 |
| 15 | Treated Water Storage Reservoir | Retained | 1 | 2438.82 | 4,500 |

* Reference numbers correspond to Figure 1-17.

**Proposed residuals management system**

Residuals generated from the clarification and filtration stages will be managed through the upgraded residuals management system.

Clarifier residuals will be conveyed to a new sludge balancing tank.

Used filter washwater from the rapid gravity filters and Granular Activated Carbon filters will be conveyed to the new used washwater equalisation tanks (UWWETs) and used washwater settlement tanks (UWWSTs) prior to onward transfer to the sludge balancing tank.

Residuals are then transferred from the new sludge balancing tank to the existing picket fence thickener. Sludge will be conditioned through polymer dosing and thickened within the existing picket fence thickener. Thickened sludge will then be transferred to the proposed sludge holding tank prior to dewatering.

Sludge dewatering will be undertaken using upgraded mechanical dewatering equipment, including polymer dosing, plate press, sludge collection and filtrate return systems. Filtrate and supernatant streams generated from the residuals management process will be returned to the head of the treatment process or to the appropriate upstream process stage, subject to final detailed design and operational requirements.

Dewatered sludge will be stored securely on site prior to removal by an appropriately authorised contractor. It will be transported to an appropriately authorised facility for treatment and recovery, with beneficial re-use prioritised where practicable in line with circular economy principles, regulatory requirements and Uisce Éireann's residuals management approach.

A summary of new and retained residual management assets are set out in Table 1-3.

**Table 1-3 — Proposed Residual Management Infrastructure.**

| Ref. no.* | Asset | Retained / New | No. Units | Area ($m^2$) | Unit Volume ($m^3$) |
|---|---|---|---|---|---|
| 16 | Used Washwater Equalisation Tank | New | 3 | 335.9 | 412 |
| 17 | Used Washwater Settlement Tank | New | 3 | 385.54 | 492 |
| 19 | Sludge Dewatering Building | Retained | 1 | 58.46 | - |
| 20 | Washwater Supernatant Recirculation - Pumping Station | New | 1 | 33 | 15 |
| 21 | Sludge Balance Tank | New | 1 | 155.76 | 129 |
| 22 | Sludge Holding Tank | New | 1 | 175.92 | 151 |
| 23 | Sludge Thickening Tank – picket fence thickener | Retained | 1 | 28.27 | 69 |
| 28 | Washwater Draindown Tank, inlet Pump Station and outlet Pump Station | New | 1 | 428.83 | 400 |
| 29 | Wastewater service return pumping station | New | 1 | 10 | 4.8 |

| Ref. no.* | Asset | Retained / New | No. Units | Area ($m^2$) | Unit Volume ($m^3$) |
|---|---|---|---|---|---|
| 30 | Wastewater treatment system and percolation area | New | 1 | 5.52 | 2.8 |
| | Supernatant Balance Tank | Retained | 1 | 69.19 | 205 |

* Reference numbers correspond to Figure 1-17.

**Proposed Chemical Storage and Dosing Infrastructure**

The proposed chemical storage and dosing infrastructure is summarised in Table 1-4. Storage volumes represent the maximum chemical storage capacity provided on site for assessment purposes. Chemical storage and dosing systems will be designed with appropriate containment, safe access, delivery, transfer, inspection and emergency response provisions in accordance with Uisce Éireann technical requirements and relevant health, safety and environmental requirements. Chemical deliveries will occur periodically, with delivery frequency dependent on operational demand and final detailed design.

**Table 1-4 — Proposed Chemical Storage and Dosing Infrastructure.**

| Ref. No.* | Asset | Existing / Retained / Proposed | No. Units | Max. Area (m2) | Max. unit Volume (m3) |
|---|---|---|---|---|---|
| 24 | Fluoridation – Hydrofluorosilic Acid Bulk Tanks, Day Tank and Dosing System | Retained | 2 | 26.95 | 10 |
| 25 | Disinfection/ Treated Water Storage – 10% Sodium hypochlorite Bulk Storage Tanks | New | 3 - one additional and two replacements of existing | 11.61 | 3 |
| 26 | Coagulation – 8% Aluminium Sulphate Bulk Storage Tanks | New | 2 | 66.37 | 40 |
| 27 | pH Adjustment – 96% Sulphuric Acid Bulk Storage Tanks | New | 2 | 26.67 | 10 |
| | pH Correction – Sodium Carbonate Building | New | 1 | 312.5 | N/a |
| | pH Correction – Sodium Carbonate Bulk Storage Silo | New | 2 | 86.7 | 60 |
| | Polymer Dosing System – Flocculation | Retained | 1 | N/a | N/a |
| | Polymer Dosing System – PFT & UWWETs | New | 1 | N/a | N/a |

| | | | | | |
|---|---|---|---|---|---|
| | Polymer Dosing System – Sludge Dewatering | New | 1 | N/a | N/a |

* Reference numbers correspond to Figure 1-17.

#### 1.2.4.2.2 Power Supply & Renewable Energy

There is existing electricity supply to the site. A new ESB medium voltage (MV) substation incorporating a 300 kVA transformer is proposed to meet anticipated increase in electricity demand. The new substation will be maintained and operated by the ESB.

The diversion of the existing overhead ESB in the west of the site, will be required for the Proposed Development. An ESB application has been submitted for this line diversion.

Solar PV will be provided for at the site, located to the south of the site and on tank roofs. Energy generated from the solar farm will supply the WTP. There will be no export of power to the Grid.

A back-up power supply, in the form of a connection for a standby diesel generator and plinth, is provided in the event of a power outage.

#### 1.2.4.2.3 Ancillary works

**Access Road & Pavement**

Access and egress to site will be through the existing WTP entrance gate, on the L1111. No major alterations to the current access road are proposed. There is an existing security gate north of the building.

A new security fenceline and gate is proposed all around the operational area of the proposed works. The new ESB substation is located near the main entrance with dedicated security fencing and gate.

Additional access road extents (up to 1,100 $m^2$) will be laid to serve most of the proposed works such as new GAC filter gallery, new dewatering building, clean backwash tank, washwater treatment facilities, at the east of the current plant. The new road will be of asphalt and new pavements will be of permeable surfaces. There is concrete hardstanding around all proposed works. Appropriate lighting will also be provided in line with the provisions set out in Section 1.3.6.

**Fencing / Boundary**

There is existing timber and post fencing all around the site perimeter and along the existing internal access road at the south. There is an access gate at the entrance and a post and wire mesh fence (approx. 1.8 m high) and another access gate near the existing building. A new 2.4 m high palisade fence and security gate is proposed around the operational area of the site.

**Stormwater Management**

The existing surface water management system consists of a conventional system of gullies and drains across the road, running towards soakpits along existing roads. Additional stormwater run-off from proposed buildings, hardstanding and roads, will be conveyed by a new pipe network to petrol interceptors and flow into ponds and soakways proposed at different locations within the site. Some of the existing soakways will be abandoned with surface water captured and redirected to the new ponds and soakways.

**Wastewater management**

The existing septic tank is to be decommissioned and a new wastewater treatment system with percolation area is proposed at the northern side of the site. It will collect wastewater from existing toilets and proposed eye wash and handwash facilities. The new wastewater treatment system will be installed in accordance with a site suitability assessment to ensure it meets EPA requirements. The new wastewater treatment system will be

designed in accordance with the EPA (2022) Code of Practice for Domestic Waste Water Treatment System. It is a requirement of the Mayo County Development Plan 2022-2028 that these are carried out by someone with Further Education and Training Awards Council (FETAC) level 6 in Supervisory Skills Award (SSA).

**Site lighting**
Post mounted luminaires are proposed on site, in addition to existing high-level lighting at the site. Access roads will be lit by proposed post mounted luminaires. Working areas between buildings/structures will be lit by wall mounted luminaires.

**Landscaping**
In terms of landscaping, the Lisglennon WTP site will be subject to landscaping and biodiversity enhancement measures, which will include but are not limited to:

- Planting of native hedgerows;
- Planting of native trees;
- Installation of bird and bat boxes;
- Scrub planting as an understory comprised of native Irish species, areas of wildflower mixes, all of which will be suitable for native pollinator species; and
- It is proposed to repurpose non-used parts of the site to promote the growth of wildflowers, native trees and hedgerows.

Where appropriate, additional topsoil will be spread and graded between 1 to 2 m to avoid impact to the existing trees and will be completed in advance of any planting. Placement of berms and bunding will be concentrated in the north and northwest of the site. Care will be taken not to dwarf the wall at the entrance and along the road. This will then be planted with new woodland mix. Proposed landscaping is shown in Drawing 10025936-ATK-L3-ZZ-DR-CE-211723.

### 1.2.4.3 Construction Works

The construction works at Lisglennon WTP will be undertaken in a planned and phased manner, with the objective of maintaining continuity of water treatment operations throughout the construction period, insofar as practicable. The existing treatment stream will remain operational while new process units, tanks, buildings, pipework and associated mechanical, electrical, instrumentation, control and automation infrastructure are constructed offline. Where temporary shutdowns, isolations or tie-ins are required, these will be planned in advance in consultation with Uisce Éireann Operations. Appropriate operational controls, including the use of available treated water storage, will be implemented to maintain continuity of supply.

Initial activities will comprise site establishment, site clearance, formation of temporary working areas and establishment of the site compound. Existing operational assets, buried services, process units and access routes will be identified and protected prior to the commencement of intrusive works. Construction activities will be managed in accordance with the CEMP, with controls implemented for noise, vibration, dust, surface water management, materials handling and waste management (see Section 1.3.4).

Bulk earthworks will be undertaken to facilitate the construction of the proposed process infrastructure, tanks, foundations, pipework corridors and access roads.

Priority will be given to enabling works that support operational resilience and facilitate subsequent tie-ins. These works will include construction of the new treated water reservoir and installation of key interconnecting pipework to provide additional treated water storage and assist in the management of planned shutdowns, testing and commissioning. Initial pipework installations will also establish connections to proposed downstream

and upstream process units, including the chlorine contact tank, treated water pumping, UV treatment and associated dosing systems.

Based on the current design and ground investigation information, excavations at Lisglennon WTP are anticipated to extend generally to approximately 3 to 4 m below ground level (bgl), although excavation depths will vary locally depending on the requirements for tanks, foundations, pipework, roads and associated below-ground infrastructure. Ground investigation data indicates that shallow bedrock is present across parts of the WTP site, typically at depths of approximately 1 to 2 m bgl. This will be taken into account during detailed design and construction phase, including the final excavation methodology and opportunities for re-use of excavated material. General provisions for the management of excavated material is set out in Section 1.6.3.

It is currently estimated that construction of the new WTP process streams, tanks and associated infrastructure will generate approximately 10,878 m³ of excavated material. Approximately 5,945 m³ of fill is expected to be required to raise and form the proposed sludge treatment area to the east of the site. Suitable excavated material will be re-used on site where practicable, subject to geotechnical suitability and environmental testing. Any surplus or unsuitable material will be managed in accordance with the CRWMP (see Section 1.3.4).

The proposed treatment infrastructure will then be constructed in stages. Works will include construction of new flocculation tanks, clarifiers, rapid gravity filters, granular activated carbon filters, backwash facilities, chlorine contact tank, chemical dosing infrastructure, soda ash dosing building, pump house and UV building. Associated below-ground and above-ground pipework, valves, chambers, ducting, instrumentation and control interfaces will be installed progressively as each process area is developed. Mechanical, electrical, instrumentation, control and automation systems, including modifications to control panels and Supervisory Control and Data Acquisition (SCADA), will be installed and commissioned as the new process elements are brought into service.

Residuals management infrastructure will be constructed in parallel with the clean water process works where practicable. These works will include sludge balancing, sludge holding and dewatering infrastructure, together with associated pumping, polymer dosing, filtrate return and ancillary systems. Temporary residuals management measures, such as mobile dewatering equipment, may be used where required to maintain continuity of sludge processing during construction. Existing residuals management infrastructure will only be decommissioned, refurbished or repurposed once replacement systems are operational and available for service.

The new and upgraded treatment processes will be commissioned progressively. Individual process units will be tested and brought into service in stages, allowing flows to be transferred incrementally and enabling refurbishment or integration of retained existing assets where required. Final commissioning will include performance testing, verification of hydraulic and process performance, testing of instrumentation and control systems, and confirmation that the upgraded plant can operate as an integrated treatment system.

Ancillary works, including access roads, hardstanding, drainage, security fencing and lighting, will be completed as the main construction works progress and finalised following completion of the principal process works. The proposed solar PV array will be installed after completion of the main WTP upgrade works, where practicable, to avoid conflict with construction access, laydown areas and plant movements. On completion of construction, temporary works will be removed and disturbed areas will be reinstated. Landscaping and biodiversity enhancement measures will then be implemented in accordance with the landscape design and biodiversity net gain proposals.

Works at the Lisglennon WTP are anticipated to take 35 months to complete. The works may be undertaken in stages and are not necessarily sequential, subject to programme, construction logistics, commissioning requirements and coordination with other elements of the Proposed Development.

#### 1.2.4.4 Operation and Maintenance

The upgraded Lisglennon WTP will continue to operate as a key water treatment facility within the regional supply system. The upgraded plant will integrate retained existing assets with newly constructed treatment streams, storage, chemical dosing, residuals management and control systems to provide an expanded and more resilient treatment process.

Operation of the WTP will be controlled through automated monitoring and control systems, supported by routine operator oversight. The main treatment processes will include coagulation and flocculation, clarification, rapid gravity filtration, granular activated carbon filtration, disinfection, pH correction, treated water storage and residuals management. Process performance will be monitored through instrumentation, sampling and operational checks to confirm that treated water quality and process performance remain within the required operational parameters.

Routine inspection and planned preventative maintenance will be undertaken for civil, mechanical, electrical, instrumentation, control and automation assets. This will include inspection and maintenance of tanks, filters, pumps, valves, chemical storage and dosing systems, UV units, control panels, instrumentation, pipework, access infrastructure and site drainage. Maintenance activities will generally be undertaken within the operational WTP site and will be managed in accordance with Uisce Éireann operational procedures and relevant health, safety and environmental requirements.

Chemical storage and dosing systems will be operated and maintained in accordance with applicable safety and environmental controls, including inspection of bunded areas, transfer systems and associated pipework. Residuals generated during the treatment process will continue to be managed on site through the upgraded residuals management infrastructure, including sludge balancing, thickening, holding, dewatering and secure storage prior to removal from site by an appropriately authorised contractor.

Operational traffic associated with the upgraded WTP will include staff movements, routine maintenance visits, chemical deliveries, sludge collection and occasional specialist maintenance. The frequency of these movements will vary depending on operational requirements but will remain typical of an operational water treatment plant of this scale. Solar PV infrastructure, site lighting, security fencing, access roads, hardstanding, drainage, landscaping and biodiversity enhancement areas will also be inspected and maintained as part of routine site operations.

The upgraded WTP will be integrated into the wider network control strategy and operated to support continuity of supply, process resilience and compliance with drinking water quality requirements.

### 1.2.5 Treated Water Pipelines B, C, D and E: Lisglennon WTP to Lough Talt WTP

#### 1.2.5.1 Existing Treated Water Pipelines

The existing pipeline conveys treated water from Lisglennon WTP to Ballina, Bonniconlon and surrounds. Between Lisglennon WTP and Lisglennon RWS&PS, the existing treated water pipeline runs parallel to the raw water mains. From the Lisglennon RWS&PS, the existing pipeline continues east along the L11109 before joining the L5147. From the L5147, the route crosses a section of agricultural land until the R314. The route then follows the R314 southwards to Belleek Crossroads (where there is an existing offtake to Ballina), before turning east onto the L5140. From there, the route crosses through the grounds of Belleek Castle and woodland to the L1120, Quay Road, and crosses the River Moy at an existing crossing. On the eastern side of the River Moy, the existing pipeline supplies treated water to Creggs Road and Bonniconlon via an offtake.

There is no existing pipeline from Creggs Road to Lough Talt. The route corridor has been developed to follow existing public roads, existing utility corridors and existing pipeline alignments where practicable, with sections across private lands where required to achieve hydraulic, engineering, environmental and constructability objectives.

### 1.2.5.2 Proposed Treated Water Pipelines

The proposed treated water pipeline route corridor between Lisglennon WTP and Lough Talt WTP extends for approximately 30.2 km. From Lisglennon WTP, the route corridor follows the existing pipeline towards the existing River Moy crossing infrastructure. Within the grounds of Belleek Castle and Woodlands, the route deviates from the existing pipeline and follows a private track, to the River Moy (see inset in Figure 1-20).

The proposed pipeline will then tie into either side of the existing watermain that crosses River Moy. There are no works proposed in the River Moy. On the eastern side of the River Moy, the route corridor follows the L1101, Creggs Road, eastwards, passing through the junction with the N59 and continuing to the junction with the L5132, Behy Road. The existing pipeline on Creggs Road and Bonniconlon Offtake will be retained and remain in service, and do not form part of the Proposed Development.

The route then follows the L5132 eastwards onto the L51333 at Behy More for approximately 500 m. At this location, the route leaves the public road corridor and crosses private lands, including a crossing of the Glenree / Brusna River. The route then rejoins the public road network on the R294, Bonniconlon Road, in the vicinity of the junction with the L51341 at Corrimbla South, before continuing along the R294 to the proposed Bonniconlon BPS as described in Section 1.2.6.

From the proposed Bonniconlon BPS, the route corridor crosses the L5135 and the Srafaungal River within private lands before rejoining the R294. It then continues eastwards along the R294 to Bonniconlon village. From Bonniconlon village, the route follows the L51172, Newtown Road, passing the Bonniconlon Reservoir site, as described in Section 1.2.9, before continuing onto the Drumsheen Loop (walking trail) / L51357. The route then crosses the R294 onto a private commonage leading to the proposed Windy Gap BPT, as described in Section 1.2.7.

From the proposed Windy Gap BPT, the route corridor rejoins the R294 and continues eastwards towards Lough Talt WTP, as described in Section 1.2.8.

The route corridor passes through the outskirts of Ballina and through Bonniconlon and traverses a predominantly rural landscape, including agricultural lands, public roads, private lands, woodland areas and dispersed residential properties. Land use, access, residential amenity, traffic, biodiversity, watercourse crossings, cultural heritage and agricultural considerations associated with the route corridor are assessed in the relevant specialist chapters of the submitted EIAR. The surrounding area is predominantly agricultural land with a number of private and residential properties in proximity.

### 1.2.5.3 Proposed Upgrades

The proposed route corridor from Lisglennon WTP to Lough Talt WTP is illustrated in Figure 1-20. It is divided into four discrete sections:

- Pipeline B – Lisglennon WTP to Existing River Moy Crossing;
- Pipeline C – Existing River Moy Crossing to Bonniconlon BPS;
- Pipeline D – Bonniconlon BPS to Windy Gap BPT; and
- Pipeline E – Windy Gap BPT to Lough Talt WTP.

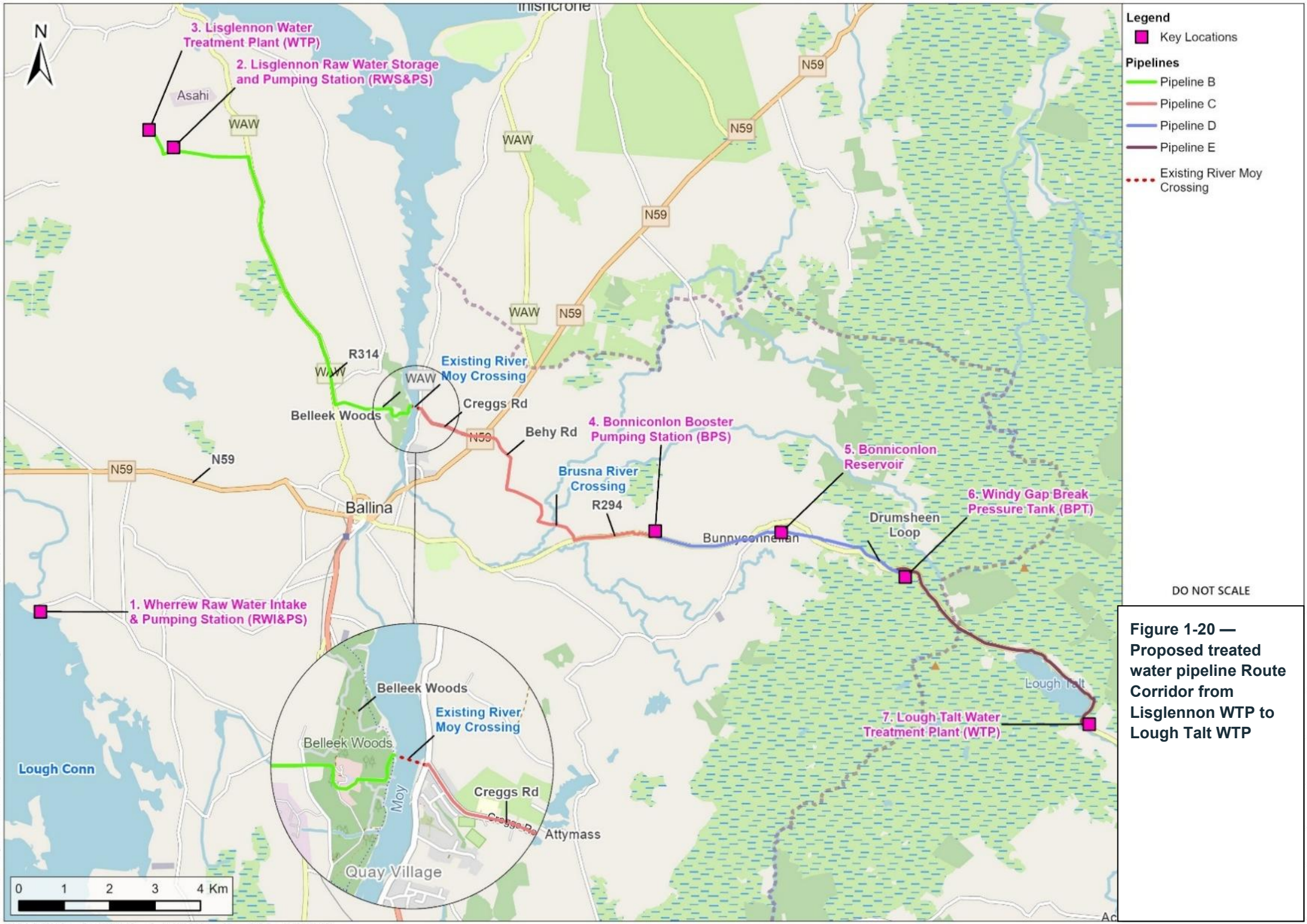



**Figure 1-20 — Proposed treated water pipeline Route Corridor from Lisglennon WTP to Lough Talt WTP**

The proposed works for each section of the treated water pipelines are as follows:

- Pipeline B – Lisglennon WTP to Existing River Moy Crossing:
  - New pipeline, approx. 710 mm diameter from Lisglennon WTP to Junction R314 and Belleek Rd;
  - New pipeline, approx. 560 mm diameter from Junction R314 and Belleek Rd to Existing River Moy Crossing;
  - Tie in with the existing watermain to the west of the Existing River Moy crossing;
  - Transfer of a number of supply connections from the existing network to the new trunk main, including provision of flowmeters connected to the telemetry system;
  - Connection to existing Ballina Offtake;
  - Abandon existing 400 mm to 500 mm diameter trunk main between Lisglennon WTP and Ballina Town; and
  - Abandon existing 350 mm mains between the R314 and Quay Road.
- Pipeline C – Existing River Moy Crossing to Bonniconlon BPS Trunk Main:
  - Tie in with the existing watermain to the east of the Existing River Moy crossing;
  - New pipeline, approx. 500 mm to 560 mm diameter, from River Moy Crossing to Bonniconlon BPS; and
  - New offtake to facilitate a future connection to Lough Easkey Regional Water Supply Scheme (RWSS) will be provided at the Creggs Road and N59 junction.
- Pipeline D – Bonniconlon BPS to Windy Gap BPT Trunk Main:
  - New pipeline, approx. 500 mm – 560 mm diameter, from the new Bonniconlon BPS to Windy Gap BPT on the R294 / L51172 / L51357.
- Pipeline E – Windy Gap BPT to Lough Talt WTP Trunk Main:
  - New pipeline, approx. 450 mm diameter from Windy Gap BPT to the existing Lough Talt WTP on the R294.

Ancillary pipeline infrastructure, including valves, fittings, marker posts, flowmeters, washout/scour arrangements, air valves, chambers, manholes and inspection chambers, will be installed as required to facilitate the operation, monitoring, maintenance, flushing, scouring and identification of the treated water pipeline system. The pipeline sections are summarised in Table 1-5.

**Table 1-5 — Summary of proposed treated water pipeline sections**

| Section | Approx. Diameter (mm) | Start location | End location | Approx. length (km) |
|---|---|---|---|---|
| Pipeline B | 710 | Lisglennon WTP | Junction R314 and Belleek Rd | 8.4 |
| Pipeline B | 560 | Junction R314 and Belleek Rd | Existing River Moy Crossing | 2.0 |
| Pipeline C | 500-560 | Existing River Moy Crossing | Bonniconlon BPS | 7.2 |
| Pipeline D | 500-560 | Bonniconlon BPS | Windy Gap BPT | 6.0 |
| Pipeline E | 450 | Windy Gap BPT | Lough Talt WTP | 6.6 |

### 1.2.5.4 Construction

The construction methodology for Treated Water Pipelines B, C, D and E has been developed based on the current stage of design and the environmental assessments in the submitted EIAR. The final construction methodology, phasing, temporary works arrangements and crossing techniques will be confirmed by the Appointed Contractor during detailed design and construction planning. Any refinements will remain within the project description, design parameters and environmental assessments and will be implemented in accordance with the environmental controls set out in the construction management plans (Section 1.3.4).

All works will be undertaken in accordance with construction provisions set out in Section 1.3. Pipeline construction will be undertaken progressively in discrete sections along the route corridor, and which may be installed at the same time, subject to programme, traffic management requirements, environmental constraints, land access and construction logistics. The works may therefore be phased and are not necessarily sequential.

Temporary working areas and site compounds will be established to support the works, as described in Section 1.3.6. The pipeline route will predominantly follow existing public roads, with sections in private lands, where required. Works within public roads will generally be undertaken within a single traffic lane where practicable, with temporary traffic management measures implemented to maintain safety for road users, pedestrians, cyclists, local residents and the construction workforce. Traffic management measures may include stop/go systems, temporary traffic signals, lane closures, short-duration road closures and signed diversions, as agreed with the relevant roads authority.

Where the pipeline is installed within private lands, the typical construction working width will generally be approximately 20 m, unless otherwise agreed with the relevant landowner or reduced locally in response to environmental, cultural heritage, access, topographical or constructability constraints. The working width will accommodate excavation, pipe stringing, temporary storage of excavated material, plant movement, jointing, backfilling and reinstatement. The working width may be locally widened at bends, tie-ins, crossings, launch and reception pits, or other constrained locations where additional working space is required.

Before construction commences, the Appointed Contractor will undertake pre-construction surveys and confirmatory investigations to verify ground conditions, buried services, existing drainage, watercourse crossing locations, road constraints, access arrangements, ecological constraints, invasive species constraints and cultural heritage constraints (Section 1.3.1). The route will be set out and clearly demarcated prior to construction. Existing utilities and services will be identified, protected, diverted or supported as required in agreement with the utility/service providers.

Where works have the potential to affect access to private lands, dwellings, farms, businesses or community facilities, access arrangements will be agreed in advance with affected landowners and occupiers. There are numerous receptors identified within 100 m of the Red Line Boundary, including approx. 300 private residences, 42 businesses, 14 commercial properties (including nine schools), seven hospitals, 16 facilities, 36 local community partnerships and 36 land parcels. Construction activities will be managed to minimise disruption where practicable, with advance notification provided in accordance with the Stakeholder Communications Plan, to be prepared by the Appointed Contractor (see Section 1.3.4.3).

The pipeline will primarily be installed using conventional open-cut techniques. Trenchless techniques will be used where required to avoid or minimise disturbance to sensitive watercourses, existing infrastructure, constrained locations or other environmental or engineering constraints. Final crossing methodologies will be confirmed by the Appointed Contractor following confirmatory surveys.

The start of Pipeline B and the majority of Pipeline A, as described in Section 1.2.3, will be installed in parallel within the same trench between the treated water storage reservoir at Lisglennon WTP and the site access to

Lisglennon RWS&PS on the L11109. This approach will reduce the extent of excavation and minimise repeated disturbance within this section of the route corridor.

Excavated material will be managed in accordance with the CRWMP. Suitable excavated material will be re-used as trench backfill above the pipe surround where practicable, subject to geotechnical suitability and environmental testing. Surplus or unsuitable material will be removed from the working area and managed in accordance with the CRWMP. A project-level summary of excavated materials is provided in Section 1.6.

Existing field drains, roadside drains and agricultural drainage systems that intersect the construction working width will be surveyed and recorded before works commence. Existing drainage will be maintained during construction through temporary diversions, temporary culverting or other suitable measures. Drains affected by the works will be reinstated following pipe installation to maintain existing drainage function, unless otherwise agreed with the relevant landowner and drainage authority. Where required, pre-construction field drainage measures will be installed to maintain existing drainage patterns during construction.

Following installation, pressure testing, disinfection, flushing and commissioning of the treated water pipelines will be undertaken in accordance with Uisce Éireann requirements and relevant operational procedures. Water generated during testing, flushing or disinfection activities will be managed in accordance with the CEMP (Section 1.3.4.1) and the scour management proposals set out in Section 1.9. Discharge locations, rates and controls will be confirmed prior to commissioning and will be subject to appropriate environmental protection measures.

On completion of pipeline installation and commissioning, trenches will be backfilled. Public roads, private tracks, agricultural lands, field boundaries, drains, verges, hedgerows and other affected features will be reinstated, as appropriate, in accordance with the CEMP (Section 1.3.4.1), landowner agreements, road opening licence requirements, the Tree Protection Plan (see Section 1.3.4.4) and the landscape and biodiversity proposals included in this EIAR. Temporary working areas, compounds, temporary access tracks and redundant temporary works will be removed.

Where the proposed pipeline route is laid in areas where peat is present, an appropriate trench reinstatement to reinforce these sections such as a proprietary trench support system, with careful groundwater management will be developed. The trench build up will be dependent on the soil strata and will be as per the approved final detail design by the Contractor. It is envisaged that the trench will be backfilled with imported granular fill material and will be carefully compacted to avoid punching into the existing strata. Once backfilled, the road surface reinstatement in these sections will be as per the requirements of the relevant Road's authority. The road surfaces will be protected by using road plates or bog mats. All works in peat will be managed in accordance with the CEMP and other relevant construction management plans (see Section 1.3.4).

#### 1.2.5.4.1 Open-Cut techniques

Open-cut installation will be the primary construction technique for the treated water pipelines, except where trenchless techniques are required due to environmental, engineering, traffic, access or constructability constraints. Open-cut installation will generally involve excavation of a trench, placement of pipe bedding, installation and jointing of the pipe, placement of pipe surround material, backfilling and reinstatement.

Based on the current design and ground investigation information, for single pipelaying, trench widths are anticipated to be in the range of 1 to 1.5 m along much of the route and trench depths are anticipated to be approximately in the range of 2 to 4 m for the majority with a few locations up to 6 m deep. However, the depths will vary locally depending on pipe diameter, existing ground levels, required cover, road construction, ground conditions, existing services, watercourse / culvert crossings and hydraulic design requirements. Trench dimensions will be confirmed by the Appointed Contractor during detailed design and construction phase.

A suitable granular bedding layer will be placed at the base of the trench prior to pipe installation. Pipe sections will then be lowered into the trench, jointed and aligned. Granular pipe surround material will be placed around and above the pipe to provide protection and support. Marker tape, tracer wire, marker posts, valves, fittings, chambers, air valves, scour arrangements and other ancillary pipeline infrastructure will be installed as required.

The remaining trench will be backfilled using suitable material. Within private lands, suitable excavated material will be re-used as backfill where practicable, subject to geotechnical suitability and environmental testing. Within public roads, reinstatement will be undertaken using suitable engineered backfill, including cement bound granular material where required, and road surfaces will be reinstated in accordance with the requirements of the relevant roads authority and applicable road opening licence conditions.

A number of recreational walking and cycling trails intersect the works, notably in Belleek Woods (Section 1.2.5.4.4) and near Bonniconlon (Glen Loop – Bunnyconnellan Walking Trail, Drumsheen Loop – Bunnyconnellan walking trail and Sligo Way (Long Distance Waymarked Way) trails). Trails will be reinstated in line with the requirements of the relevant local authority and landowner agreements. The pipeline route also overlaps with the EuroVelo 1 Ireland – Atlantic Coast Route (road cycling trail). All works intersecting public trails will be managed in accordance with the CEMP and other relevant construction management plans (see Section 1.3.4).

Where open-cut installation is used to cross minor field drains or low-sensitivity drainage features, flows will be maintained using temporary over-pumping, temporary fluming, damming and pumping, temporary culverting or other suitable measures. Sediment prevention and pollution control measures will be implemented in accordance with the CEMP (Section 1.3.4.1). Affected drains will be reinstated following pipeline installation to maintain existing drainage function.

#### 1.2.5.4.2 Trenchless Methods

Trenchless installation techniques will be used where required to avoid or minimise disturbance to sensitive watercourses, existing infrastructure, roads, embankments, constrained locations or other environmental or engineering constraints. The selection of the final trenchless technique will be confirmed by the Appointed Contractor based on ground conditions, crossing length, alignment, depth, available working area, environmental sensitivity and constructability. Trenchless techniques may include horizontal directional drilling (HDD), pipe jacking, auger boring, pipe ramming or other equivalent methods.

For trenchless crossings, launch and reception pits will be established outside the watercourse channel and outside sensitive riparian areas where practicable. The pipeline or casing will then be installed beneath the obstacle without open excavation through the watercourse bed. The final locations and dimensions of launch and reception pits will be confirmed during detailed design.

HDD is a trenchless installation method in which a steerable drill head is launched from a surface entry point and guided along a predetermined alignment to a reception point, typically beneath existing infrastructure, roads or watercourses. The process generally comprises of a pilot bore, progressive enlargement of the bore to the required diameter, and pullback of the product pipe through the enlarged bore. Drilling fluid, typically bentonite-based, may be used to stabilise the bore, remove arisings and reduce friction during installation.

Where HDD is used, drilling fluids will be managed through a site-specific drilling fluid management procedure. Only suitable drilling fluids will be used, and measures will be implemented to minimise the risk of drilling fluid loss to ground or surface water. These measures may include monitoring of drilling pressures, inspection of the ground surface and watercourse banks, provision of spill response materials, and implementation of contingency measures in the event of drilling fluid breakout.

Pipe ramming is a trenchless technique that may be used to install a casing pipe beneath roads, watercourses, embankments or other obstacles where ground conditions and alignment are suitable. The method involves advancing a steel casing from a launch pit using a pneumatic or hydraulic ramming system. The material within the casing is removed during or after installation, and the carrier pipe is then installed within the casing. The annulus may be sealed or grouted as required by the final design.

Pipe jacking or auger boring may also be used where suitable. These methods generally involve installation of a casing or carrier pipe from a launch pit to a reception pit using controlled excavation or boring techniques. The final method will be selected to achieve the required crossing based on geotechnical considerations while minimising surface disturbance and protecting environmental receptors.

At watercourse crossings, where trenchless works are planned, these will be undertaken in accordance with the CEMP and relevant environmental controls (see Section 1.3.4). Plant, fuels, lubricants, drilling fluids and other materials will be stored and managed to prevent pollution. Where required, an Ecological Clerk of Works (ECoW) will oversee works at sensitive crossings.

#### 1.2.5.4.3 Surface Water Feature / Watercourse Crossings

There are approx. 30 surface water feature crossings which have been identified along the pipeline route, comprising of approx. 18 EPA-identified watercourses and 12 field drains. The locations of these surface water features were validated during site surveys and site investigations and assessed for ecological potential. Where a risk of impact to the watercourse (e.g. aquatic life or habitats) has been identified, the watercourse will be crossed using trenchless techniques, such as pipe jacking or directional drilling, or via existing crossing infrastructure.

There are no works proposed within or under the River Moy, instead the Proposed Development will tie-in to an existing 450 mm diameter pipeline crossing the River Moy (see insert in Figure 1-20).

The Glenree/Brusna River will be crossed via trenchless techniques, most likely Horizontal Directional Drilling (HDD).

For other small order watercourses, the trenchless technique ‘pipe jacking’ is a preferred methodology for crossing subject to geotechnical considerations. Open cut methodology is the preferred option for crossing field drains, many of which were observed as dry.

#### 1.2.5.4.4 Belleek Castle and Woodland

Belleek Castle and Woodland is a site of cultural heritage value set within an extensive woodland estate including the Belleek Wood Greenway Cycling Trail, Belleek Multi Access Walking Trail. In this location, the proposed pipeline route corridor follows an existing private track through the grounds to minimise interaction with mature trees, woodland habitat, built heritage features and estate infrastructure as well as avoid areas where non-native invasive species have been identified.

Construction works through Belleek Castle and Woodland will be planned and managed in accordance with the Tree Protection Plan submitted as Appendix 7-1, Volume 3 of the EIAR submitted with this application, together with the CEMP and any site-specific ecological and arboricultural requirements (see Section 1.3.4). Works in this area will be supervised, where required, by a suitably qualified ECoW and/or arborist. The objective will be to maintain the pipeline within the defined working corridor, minimise disturbance to retained trees and woodland habitat, and avoid unnecessary encroachment into Root Protection Areas.

The limits of the working area will be clearly demarcated prior to construction. Temporary protective fencing, ground protection or other physical demarcation measures will be installed where required to define the

construction corridor, protect retained trees and Root Protection Areas, and control the movement of plant, materials and personnel. Construction traffic will be directed along the existing track or other agreed access routes, insofar as practicable.

Excavated material and construction materials, including pipe sections, will not be stored within Root Protection Areas. Where excavation arisings are generated within the woodland area, they will be removed from sensitive areas as soon as practicable and transferred to an appropriate designated holding or stockpile area outside Root Protection Areas, subject to the requirements of the CEMP and the CRWMP (Section 1.3.4).

The pipeline alignment has been developed to reduce the potential for interaction with tree root systems. However, localised areas have been identified where trenching works may encounter roots associated with retained trees. Where works are required in proximity to retained trees, excavation will be undertaken using low-impact techniques, such as hand excavation or vacuum excavation, where required by the Tree Protection Plan or arboricultural supervision. Where roots are encountered, works will be undertaken in accordance with arboricultural guidance to avoid unnecessary severance or damage. Root barrier membrane may be installed where required to protect retained roots and prevent future conflict between root systems and the installed pipeline.

Plant selection and construction methods will be adapted to the sensitivity of the woodland setting. Smaller plant and low-ground-pressure equipment will be used where practicable within constrained or sensitive areas. Where heavier plant is unavoidable, appropriate ground protection measures will be implemented to reduce the risk of soil compaction within or adjacent to Root Protection Areas. Where compaction risk or localised compaction is identified, remedial measures such as soil aeration will be undertaken in accordance with arboricultural advice.

On completion of pipeline installation, disturbed areas within Belleek Castle and Woodland will be reinstated in accordance with the Tree Protection Plan, CEMP, landowner requirements and the landscaping and biodiversity proposals (see Section 1.3.4).

#### 1.2.5.5 Operation and Maintenance

The proposed treated water pipelines will operate continuously as part of the wider water supply network, conveying treated water between Lisglennon WTP and downstream infrastructure. The pipelines will operate for their design life with minimal intervention, with flows governed by upstream pumping and downstream hydraulic conditions.

Routine operation and maintenance activities will primarily comprise periodic inspection and maintenance of pipeline infrastructure, including valves, fittings and chambers. Valves will be exercised at regular intervals to ensure continued operability.

Maintenance activities will also include periodic flushing and scouring of the pipelines, where required, to maintain water quality and hydraulic performance.

The pipeline system will be monitored through the network control system, enabling operational performance to be tracked and allowing maintenance activities to be undertaken as necessary.

Operational access to the pipeline will be via permanent wayleaves across private lands, where required, and via the public road network where pipelines are located within road corridors.

## 1.2.6 Bonniconlon Booster Pumping Station (BPS)

### 1.2.6.1 Bonniconlon Booster Pumping Station site

The proposed Bonniconlon BPS site is situated at Carralavin, Bonniconlon, Ballina, Co. Mayo. It is a greenfield site located at the junction of the R294 Ballina Road and L5135 Carrownlabaun, approx. 1.8 km west of Bonniconlon. The site is bounded to the east and south by a sod ditch with areas of hedgerows further along the eastern boundary, and on the northern and western boundaries. There is an agricultural gate on the eastern boundary of the site. The River Srafaungal runs through the field on the other side of the L5135 before continuing under the R294. The proposed site is shown in Figure 1-21.



**Figure 1-21 — Proposed Bonniconlon BPS Site**

The new BPS will be constructed to transfer the full allotment of flow to Lough Talt WTP. The BPS will receive water under gravity from the Lisglennon WTP, and pump it over the local high point, to the Windy Gap BPT (Section 1.2.7), from where it gravitates to the Lough Talt WTP (Section 1.2.8).

A site layout of the proposed Bonniconlon BPS is shown in Figure 1-22, and will consist of:

- A new 320 kW booster pumping station (approx. 150 m², approx. 8 m tall) with pumping area, control room and welfare facilities, noise proofing by means of thick walls and sound-proofing measures on doors and windows (Ref. No. 1, Figure 1-22);
- Two surge vessels (approx. 20 m³ each) (Ref. No. 3, Figure 1-22);
- ESB substation (approx. 24 m², 3 m tall) with dedicated fence and entrance (Ref. No. 2, Figure 1-22);
- A new permanent standby generator (Ref. No. 4, Figure 1-22);
- Provision of solar PV infrastructure to supplement site power demand; and
- Installation of new flowmeter and associated works (Ref. No. 6, Figure 1-22);
- Ancillary site development works, including access, fencing, storm water management including pond (Ref. No. 7, Figure 1-22), wastewater management (Ref. No. 5, Figure 1-22), potable water supply, site lighting and landscaping.

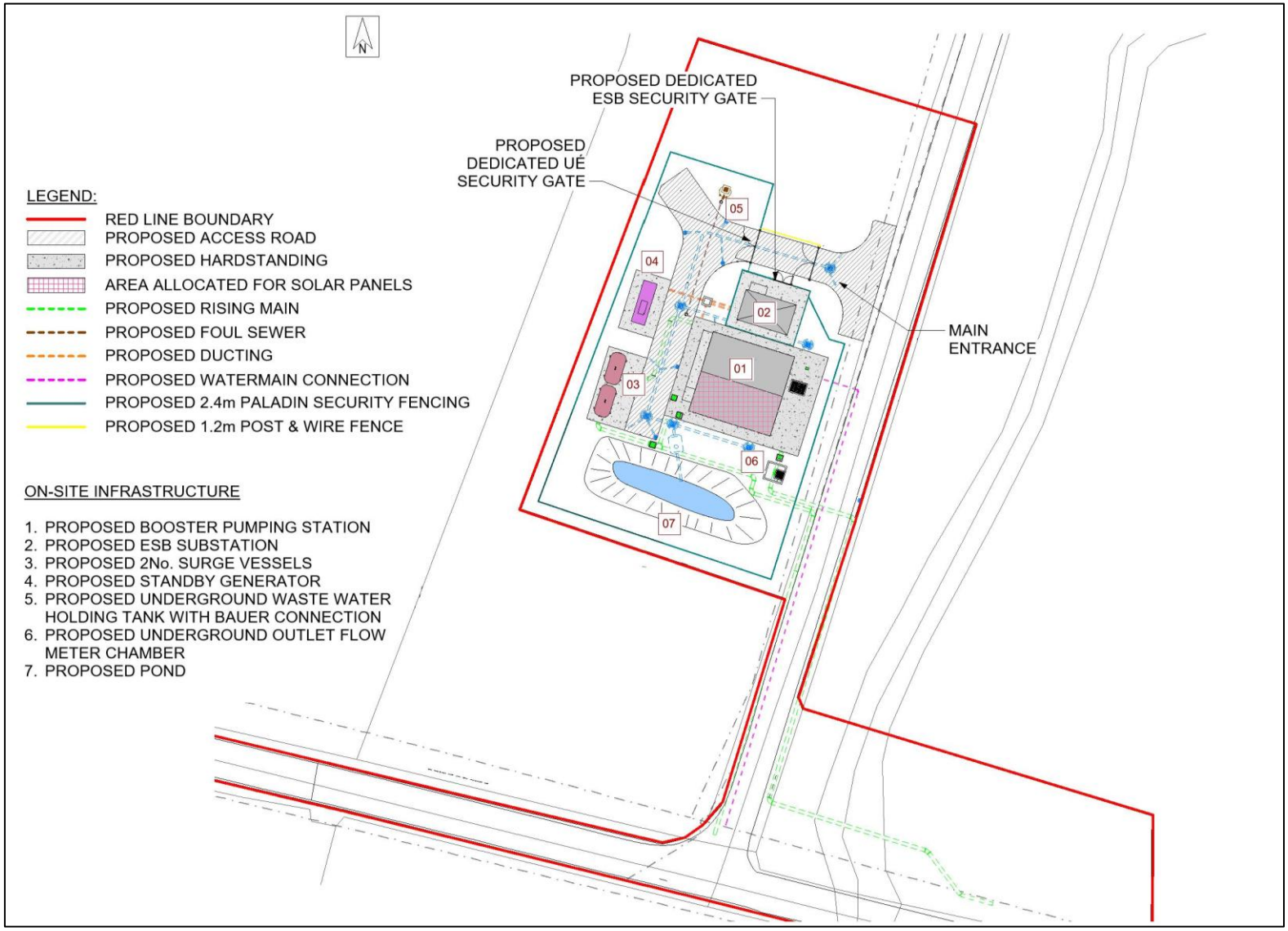



**Figure 1-22 — Site layout of the new Bonniconlon BPS**

The BPS building (Ref. No. 1, Figure 1-22) will include a small internal loading bay and setting down area, space for surge vessel compressors if required, four Pumping bays, a control room, and welfare facilities including a toilet and washbasin.

The pump station will operate in a duty/assist/standby/standby configuration, with one duty pump operating the majority of time, with the assist pump coming online in times of maximum or increased demand in the Ballina and Lough Talt RWSS.

Two surge vessels (Ref. No.3, Figure 1-22), each approx. 20 $m^3$, will be installed to act as a damper to prevent excessive surge pressures at the pump station as well as prevent sub atmospheric pressure conditions from occurring in the up and downstream pipelines.

#### 1.2.6.1.1 Power supply and renewable energy

An ESB MV substation (Ref. No. 2, Figure 1-22) will be provided for the pump station site, maintained and operated by the ESB. A substation and transformer of 400 kVA is proposed to provide sufficient power to the site. The substation will be supplied by the ESB and will be via either underground cable connection or overhead line, from the R294.

A back-up power supply, in the form of a permanent standby 400 kVA diesel generator (Ref. No. 4, Figure 1-22), will be provided in the event of a power outage to keep two pumps operational and prevent the resulting interruption of water supply. The proposed generator will have a built-in fuel storage tank capable of powering the generator for six hours, the estimated size of the embedded fuel tank will be approximately 800 to 1000 L, based on currently available models. The generator will be appropriately bunded.

Roof mounted solar panels will be installed on the BPS building, which will be used to supplement the power requirements of the BPS. Additional details are provided in Section 1.5.

#### 1.2.6.1.2 Flowmeter installation

Installation of a flowmeter and associated works will be undertaken within the Bonniconlon BPS site, immediately outside of the pumping station building (Ref. No. 7, Figure 1-22). Associated works include short pipeline/ducting sections to connect to the pressure monitoring, control and telemetry systems (located inside the pumping station), isolation valves, flow meter chambers and access covers.

#### 1.2.6.1.3 Ancillary Works

This section describes the ancillary works required for the Bonniconlon BPS site, in addition to the proposed main works mentioned above.

**Access**

Access and egress to the Bonniconlon BPS site will be through a proposed access road off the L5135 local road. The proposed main entrance will be situated approximately 100 m North off the R294 onto the L5135, in accordance with the Mayo County Development Plan 2022-2028.

The ESB substation will have its own dedicated entrance gate and access for ESB personnel. The main entrance of the BPS is shared with ESB personnel. The rest of the site will be accessed by authorised personnel only.

**Fencing / Boundary**

A 2.4 m high paladin security fencing and security gates will be provided around the operational area. There will be a dedicated 2.4 m high paladin fencing and security gate for ESB substation. A short section of 1.2 m high post and wire mesh fence will be provided along the shared access road.

The entire site will be bound by hedgerows with trees and woodland mix.

**Stormwater Management**
The proposed storm water management system consists of a conventional system of gullies and drains along the access road. Stormwater run-off from buildings, hardstanding and roads, will be collected by this new storm water network, conveyed by the proposed storm water pipe network to a petrol interceptor before draining into a proposed pond located at the southern boundary of the Bonniconlon BPS site (Ref. No. 7, Figure 1-22).

**Wastewater Management**
Wastewater from welfare facilities will be collected by proposed wastewater network within site, into an underground wastewater holding tank (Ref. No. 5, Figure 1-22), tankered away periodically and disposed of offsite to an appropriate treatment facility.

**Potable Water Supply**
A potable water connection for the BPS site's water supply will be taken from the existing 100 mm diameter watermains along the R294 road.

**Site Lighting**
Low level bollard lighting will be provided along the access road and paths to allow for a safe access throughout the site. Centrally located wall mounted luminaires will be provided at substation and Pumping station building. Refer to Section 1.8 for overall site lighting for the Proposed Development.

**Landscaping**
The proposed site is situated in an agricultural grassland area of low ecological value and will require minimal plant removal. The site has no record of invasive species and may require some removal of hedgerow within the roadside verge for the new access road and sightlines.

The site will therefore be screened from view of the public road and neighbouring properties. Proposed landscape includes planting and seeding of the following:

- Wet grassland mix in the pond area.
- Woodland mix for screening to the north of the site.
- 5 m strip of Woodland mix Screen planting to the south of the site.
- Hedgerow mix with standard trees (approx. 5 to 10 m spacing) to line the perimeter of the site to the south, east and west.

Evergreen trees and/or shrubs native to the area will be instated as a hedgerow between the road and site boundary fence to screen off the site infrastructure. The hedgerow will be allowed to rewild and grow unrestricted to provide biodiversity enhancement to the agricultural grassland site in line with UÉ policy of biodiversity net gain.

An indicative visualisation for the proposed Bonniconlon BPS is shown in Figure 1-23.



**Figure 1-23 — Bonniconlon BPS - Visualisation (for indicative purposes only)**

### 1.2.6.2 Construction Works

The construction works at the proposed Bonniconlon BPS will comprise of the development of a new standalone booster pumping station facility, including civil, mechanical, electrical, instrumentation, control and automation infrastructure, together with associated access, drainage, security, landscaping and biodiversity measures. The final construction methodology, phasing and temporary works arrangements will be confirmed by the Appointed Contractor during detailed design and construction planning. and will be implemented in accordance with the relevant construction management plans (see Section 1.3.4).

The Bonniconlon BPS will be required to transfer treated water from Lisglennon WTP onwards to the Windy Gap BPT and Lough Talt WTP. Accordingly, construction, testing and commissioning of the Bonniconlon BPS will be completed before the cessation of abstraction from Lough Talt and before any works at Lough Talt WTP that are dependent on the availability of the new treated water supply. This sequencing will support continuity of supply to the Lough Talt supply area during the transition from the existing source to the proposed supply arrangement.

Initial works will include site establishment, installation of temporary working areas, site clearance, construction of the new site access from the L5135, and formation of the site platform. Construction traffic will access the site from the L5135, and temporary traffic management measures will be implemented as required in accordance with the Construction Works Traffic Management Plan (CWTMP) and in consultation with the relevant roads authority.

Based on current ground investigation information, excavations at the Bonniconlon BPS site are anticipated to be relatively shallow, generally approximately 0.5 m to 1.0 m bgl, and for buildings, it will vary from approx. 2 m to 3 m depending on the requirements for foundations, buried pipework, chambers, drainage, ducting and formation levels. Topsoil and subsoil will be stripped separately and stored within designated stockpile areas inside the red line boundary, subject to appropriate environmental controls. Suitable excavated material will be

re-used on site where practicable, including for backfilling, site grading and landscaping, subject to geotechnical suitability and environmental testing. General provisions for management of excavated materials are set out in Section 1.6).

Any surplus or unsuitable excavated material, including rock where encountered, will be managed in accordance with the CRWMP. Material requiring removal from site will be transported to an appropriately authorised facility for recovery, treatment or disposal, as appropriate. Stockpiles will be located away from drainage features and managed to prevent sediment runoff, dust generation and contamination of surface water or groundwater.

There is potential for localised interaction with groundwater or perched water during excavation works. Where dewatering is required, water will be collected and treated through settlement tanks, silt control measures or other appropriate treatment systems prior to discharge. Any discharge from construction dewatering will be undertaken in accordance with the water management measures set out in the CEMP and relevant environmental controls (see Section 1.3). Temporary drainage measures may be installed to intercept and divert clean surface water away from excavation areas, reduce runoff entering the works area and minimise the generation of silty water.

Temporary access roads, hardstanding and working areas will be formed as required to facilitate safe construction access, plant movement, material delivery and equipment installation. Material arising from excavation of temporary access or working areas will be managed in accordance with the CRWMP and re-used on site where suitable and practicable (Section 1.3.4.5).

Foundations and concrete slabs will then be constructed for the pumping station building, ESB substation, standby generator, surge vessels and associated external plant. Underground services, drainage, ducting, chambers and below-ground pipework will be installed in parallel with the civil works, including connections to the incoming and outgoing treated water pipelines.

Superstructure works will include construction of the pumping station building, including the pumping area, control room, welfare facilities and provision for overhead lifting equipment. The ESB substation, standby generator base, surge vessel bases and associated external infrastructure will also be constructed. Construction and commissioning of the ESB substation will be undertaken by ESB Networks or its appointed contractors, as appropriate.

Mechanical, electrical, instrumentation, control and automation works will include installation of pumps, surge vessels, process pipework, valves, flow and pressure instrumentation, control panels, telemetry, standby generator connection and associated cabling and ducting. Roof-mounted solar PV panels will also be installed on the pumping station building, where practicable, following completion of the main roof and electrical works.

Noise and vibration during construction will be managed in accordance with the CEMP (see Section 1.3.4.1). Temporary acoustic screening or acoustic blankets may be installed where required, subject to the final construction methodology, equipment selection and the proximity of works to sensitive receptors.

Ancillary works will include construction of permanent access arrangements, site drainage, security fencing, gates, lighting, hardstanding and external pipework. Landscaping and biodiversity enhancement measures will be implemented following completion of the principal construction works, in accordance with the landscape design and biodiversity proposals.

Following completion of construction, the Bonniconlon BPS will be tested and commissioned. Commissioning will include mechanical and electrical testing, pressure testing, functional testing of pumps and surge vessels, telemetry and control system integration, standby generator testing, verification of alarms and interlocks, and

integration with the upstream and downstream treated water network. Final commissioning and transfer to operational service will be coordinated with commissioning of the wider scheme.

The works at Bonniconlon BPS are anticipated to take approx. six months to complete. The works may be undertaken in stages and are not necessarily sequential, subject to programme, construction logistics, commissioning requirements and coordination with other elements of the Proposed Development.

#### 1.2.6.3 Operation and Maintenance

The proposed Bonniconlon BPS will operate as an integral component of the treated water transfer system between Lisglennon WTP, Windy Gap BPT and Lough Talt WTP. The BPS is anticipated to operate for up to approximately 22 hours per day, subject to demand, network conditions and operational requirements.

Operation of the BPS will be automated through the site control system, with pump operation managed through a duty / assist / standby (four pumps in total) arrangement. The control system will manage pump start-up, shutdown and duty changeover, and will be integrated with telemetry / SCADA to support remote monitoring and operational control. Flow, pressure, pump status, alarms and other key operational parameters will be monitored to support system performance, operational resilience and continuity of supply.

The surge vessels will form part of the hydraulic protection system for the treated water transfer main. They will be operated and maintained to manage transient pressures arising from pump start-up, shutdown, power failure or other operational events, thereby reducing the risk of adverse pressure surges within the pipeline system.

Routine operation and maintenance will include operator attendance, visual inspections, functional checks and planned preventative maintenance of civil, mechanical, electrical, instrumentation, control and automation assets. This will include pumps, valves, surge vessels, pipework, flow and pressure instrumentation, control panels, telemetry equipment, standby generator, solar PV infrastructure, electrical systems, drainage, access road, hardstanding, fencing, gates, lighting and site security systems.

The standby generator and associated fuel storage will be inspected, tested and maintained as part of the planned preventative maintenance regime to confirm readiness for use during power outages or other operational contingencies. The ESB substation will be operated and maintained by ESB Networks or its appointed contractors, as appropriate. The solar PV system will be monitored and maintained to support site energy efficiency, subject to operational requirements.

Operational access to the site will be via the new access from the L5135. Routine operational traffic will generally comprise operator visits, maintenance vehicles, inspection visits and occasional specialist contractor attendance. Additional visits may be required for generator testing, equipment servicing, solar PV maintenance, landscaping maintenance or response to operational alarms.

Welfare facilities and foul drainage infrastructure at the BPS will be operated and maintained in accordance with Uisce Éireann requirements and relevant environmental controls. Surface water drainage infrastructure, including gullies, drains, petrol interceptor and attenuation / infiltration features, will be inspected and maintained to ensure continued performance.

Operation and maintenance will be undertaken in accordance with Uisce Éireann operational procedures, including procedures for abnormal operating conditions.

## 1.2.7 Windy Gap Break Pressure Tank (BPT)

### 1.2.7.1 Windy Gap BPT Site

The proposed site is located in the vicinity of the Bunnyconnellan Wind Farm granted planning permission in 2013 under Planning Application Ref. 10/514 and Appeal Ref. PL16.241506, and which comprises 12 2.3 MW wind turbines. The proposed site utilises the existing access road of the wind farm.

The site is located off the R294 which connects Bonniconlon to the west with Lough Talt to the east. The wider area is rural in nature, comprising of areas of heavy overgrowth and areas of bogland. The topography of the area varies across the landscape significantly, the areas to the north of the site are generally flat, with the landscape rising to a peak to the south of the site along the Mayo and Sligo border. The site itself is located above the level of the road (Figure 1-25). It is accessed via a private road / commonage which also provides vehicular access to the wind farm. The access road to the site is gated (Figure 1-24).



**Figure 1-24 — Site at Windy Gap**



**Figure 1-25 — Access / Commonage to Site at Windy Gap**

Proposed BPT is required to provide operational and transient suppression benefits (i.e. to regulate water pressure) and serve as a storage tank for the Lough Talt network. Water pressure regulation prevents surges which can result in damage to the network (e.g. a burst pipeline) by creating a hydraulic break between pumped water and conveyance under gravity. The location is driven by the hydraulic requirement to be located at or beyond the highest point of the pumped section of the treated water pipeline.

A proposed site layout is shown in Figure 1-26. The Proposed Development will consist of:

- A new BPT with a storage capacity of approx. 80 $m^3$ (Ref No. 1, Figure 1-26);
- A new scour extraction kiosk and a new control kiosk (Ref Nos. 5 and 6, Figure 1-26);
- Associated inlet pipe (Pipeline D), outlet pipe (Pipeline E), overflow pipe and scour line;
- A new Precast Cement Concrete inspection/collection chamber approx. 900 mm diameter (Ref No. 4, Figure 1-26);
- Associated works including underground flowmeter chambers (Ref No. 3, Figure 1-26), valve chambers, pipework; and,
- Ancillary site development works, including access arrangements, hardstanding, surface water management, site lighting, fencing, security and landscaping.

A typical 3D view of the proposed BPT site is shown in Figure 1-27.

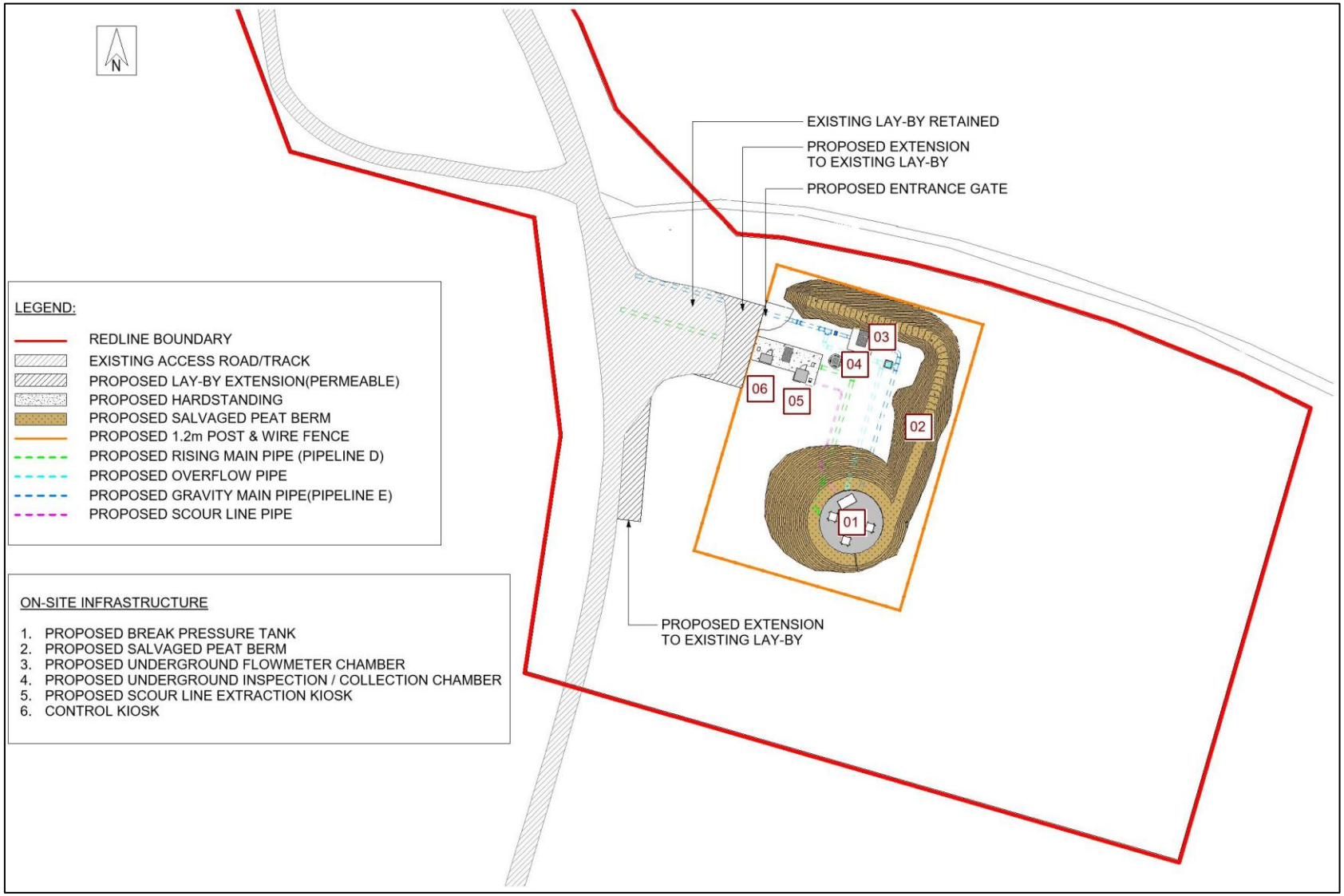



**Figure 1-26 — Proposed BPT at Windy Gap Break Pressure Tank Layout**

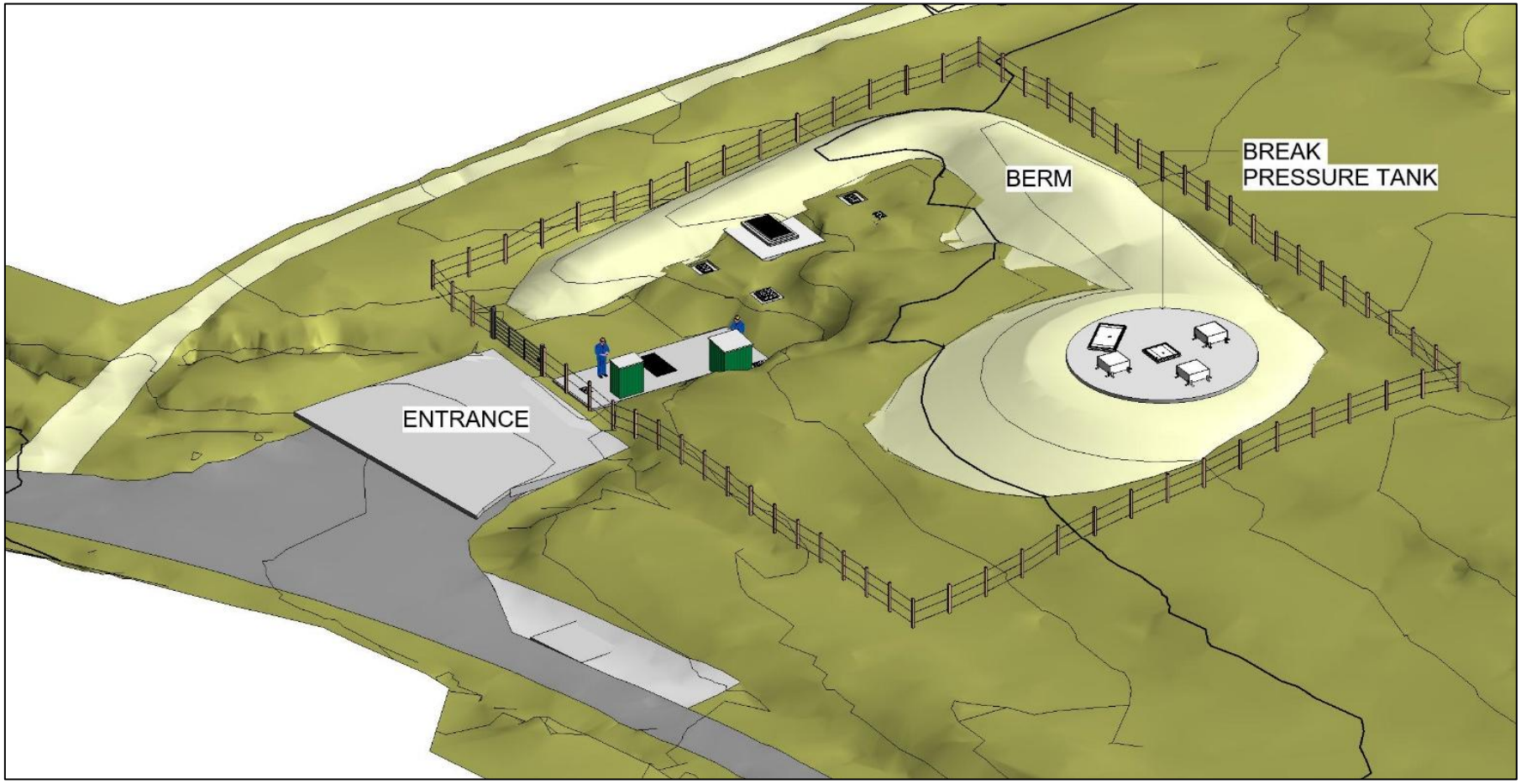



**Figure 1-27 — Proposed BPT at Windy Gap – A typical 3D view**

The proposed BPT at Windy Gap, Ballina, Co. Mayo (Ref No. 1, Figure 1-26), will provide a storage volume of approximately 80 m³. The internal dimensions of the proposed tank will be approximately 7.5 m diameter and 2.3 m depth, including freeboard. The BPT site will include inlet (green, Figure 1-26) and outlet pipework (dark blue, Figure 1-26), overflow pipework (light blue, Figure 1-26) and a scour line (magenta, Figure 1-26). The inlet pipe from Pipeline D (green, Figure 1-26) connects into the proposed BPT and the outlet pipework will connect to the Pipeline E (dark blue, Figure 1-26) which conveys treated water flows to Lough Talt WTP. The high-level overflow pipe (light blue, Figure 1-26) will be connected to the treated water network and overflows will be directed back into the network via proposed Pipeline E (dark blue, Figure 1-26). The scour line (magenta, Figure 1-26) will connect to a scour extraction point fitted with a Bauer-type tanker connection, housed within a dedicated scour extraction kiosk (Ref. No. 5, Figure 1-26). Ancillary hydraulic and control infrastructure will include underground flowmeter chambers (Ref. No. 3, Figure 1-26), valve chambers, associated pipework, a scour extraction kiosk (Ref. No. 5, Figure 1-26) and a control kiosk (Ref. No. 6, Figure 1-26).

#### 1.2.7.1.1 Habitat-specific design considerations

The proposed BPT is located in bogland. Bog is acidic, therefore proposed mitigation measures include using specific concrete mix that is robust to construction. To manage and monitor any leaks, an impermeable membrane will be installed within the pipe surround / pipe bedding, within the trenches of all underground pipelines within the site. A geomembrane or liner wrapped approx. 80 mm diameter perforated drains will be installed within the pipe surround / pipe bedding to collect any leaks from the underground treated water pipelines. These perforated drains will collect any leaks and convey into a 900 mm diameter Precast Cement Concrete inspection/collection chamber. The operations personnel will inspect the chamber periodically for any leaks and any collected treated water will be disposed of appropriately.

The BPT will be a precast concrete tank and will be installed by standard methods. The BPT will have appropriate protective / resistant coatings suitable for the bog ground.

#### 1.2.7.1.2 Power Supply

A new ESB connection will be required at this site to power instruments, telemetry outstation and site lighting, which is subject to an application submitted to the ESB, via overhead line. It is anticipated that ESB will provide connection via the existing MV Overhead lines to the west of the site subject to detail design and further engagement with ESB.

#### 1.2.7.1.3 Ancillary works

**Access**

Access to the site will be via an existing access road / commonage off the regional road R294 which leads to the Bunneyconnellan Wind Farm, south of the proposed BPT. The distance between the site and the regional road R294 is approximately 260 m. The existing access road will not require upgrading. An existing lay-by located in front of the site will be upgraded using asphalt to accommodate vehicles during construction, operation and maintenance.

**Fencing / Boundary**

A new post and wire fence (approx. 1.2 m in height) is proposed around the site (orange line, Figure 1-26). A farm gate is proposed at the entrance to the site. There will be no security fencing. Minimum physical site security will be provided due to the sensitive landscape. A 1.2 m high stock fence and a pedestrian gate will be provided in accordance with TEC-600-01 to keep livestock from entering the site.

**Stormwater Management**

The bog habitat at this site is groundwater-dependent and, to a lesser extent, reliant on rainfall. No site drainage is proposed, allowing rainfall to continue infiltrating the ground as occurs at present. Runoff from impermeable surfaces, i.e. the reservoir tank roof, hardstanding areas, roof of kiosks, will be minimal and can dissipate into

the surrounding peat. The BPT will be a precast concrete tank. To manage tank roof runoff and ensure it is directed into the surrounding peat rather than flowing down the tank sides, an impermeable membrane will be installed around the tank at an approximate depth of 500 mm bgl. This will be overlain by an approx. 50 mm layer of sand, followed by an approx. 450 mm layer of salvaged peat. Rainfall within the Windy Gap BPT site will continue to infiltrate and drain into the bog habitat, as occurs under existing conditions.

**Site Lighting**
Low level bollard will be provided on the plinth to allow for a safe access to kiosks. Internal ceiling mounted luminaire will be provided in the kiosk. Refer to Section 1.8 for overall site lighting for the Proposed Development.

**Landscaping**
Given the high landscape sensitivity of the area, the proposed BPT will be entirely below ground with a gradual embankment built up around the tank. Excavated materials will be salvaged for re-instatement in order to offset potential visual and ecological constraints. Every effort will be made to create berm screening from bog material excavated from the site (Ref. No. 2, Figure 1-26).

### 1.2.7.2 Construction

The construction works at Windy Gap BPT will comprise the installation of a new below-ground precast concrete break pressure tank, associated inlet, outlet, overflow and scour pipework, flowmeter and valve chambers, precast cement concrete inspection / collection chamber, scour extraction kiosk, control kiosk, power and telemetry connections, access and hardstanding improvements, fencing, landscaping and habitat reinstatement. The final construction methodology, phasing and temporary works arrangements will be confirmed by the Appointed Contractor during detailed design and construction planning. Any refinements will remain within the project description, design parameters and environmental assessments submitted with this application and will be implemented in accordance with the CEMP, CRWMP and other relevant construction management plans (see Section 1.3.4).

Site access will be via the existing Bunnyconnellan Wind Farm access road from the R294. Construction traffic will use the existing gated wind farm access route, subject to appropriate access arrangements and coordination with the wind farm operator. Temporary traffic management measures will be implemented where required in accordance with the Construction Traffic Management Plan (Section 1.3.4.2) and in consultation with the relevant roads authority.

Initial works will include site establishment, demarcation of the works area, installation of temporary working areas, protection of sensitive habitats, confirmation of existing services and drainage, and site preparation. The limits of construction activity will be clearly defined before works commence. Plant movements and material storage will be confined to designated working areas to minimise disturbance to the surrounding bog habitat.

Based on current ground investigation information, the ground conditions at the Windy Gap BPT site comprise shallow peat, anticipated to be approx.. 0.5 m in depth, overlying silty sand / gravel. Excavation will be required to install the below-ground BPT, associated chambers, pipework and kiosks. The main excavation for the BPT is anticipated to extend to approx. 3 m bgl, subject to detailed design and confirmatory ground conditions. Excavations for pipework, chambers, ducting and kiosk foundations will be shallower and will vary locally depending on final layout, cover requirements and ground conditions (see Section 1.6).

Peat and underlying mineral soils will be stripped and stored separately within designated areas. Peat turves and surface vegetation will be lifted intact where practicable and retained for reinstatement. Peat will be stored in a manner that maintains moisture content and preserves its suitability for re-use in habitat reinstatement. Excavated material will be managed in accordance with the CRWMP (Section 1.3.4.5). Suitable excavated material, including peat and mineral soils, will be re-used on site where practicable for backfilling, grading,

formation of the landscaped embankment and habitat reinstatement. Surplus or unsuitable material will be removed from site and transported to an appropriately authorised facility for recovery, treatment or disposal, as appropriate.

The BPT excavation will be formed to the required depth and founding level. Localised temporary works, such as trench support, battering of excavation sides or other stabilisation measures, will be used where required to maintain safe working conditions and protect adjacent peat and ground stability. Deep or perimeter dewatering is not anticipated. Where localised water ingress occurs, sump pumping may be used on a limited basis. Any pumped water will be managed through appropriate silt control measures before discharge or infiltration, in accordance with the CEMP and relevant environmental controls (see Section 1.3.4).

The BPT will be constructed as a precast concrete structure or equivalent tank system suitable for the ground conditions and operational requirements. The tank will be designed and constructed to account for potentially acidic ground and groundwater conditions associated with the bog environment. An impermeable geomembrane or liner will be installed on the tank surface approx. 500 mm below the finished level to allow surface runoff percolation away from the tank The associated below-ground pipework will be provided with the specified impermeable membrane, leak collection and inspection arrangements, including wrapped perforated drains and an inspection / collection chamber, where required by the final design. These measures will allow treated water leakage, if any, to be directed to a defined inspection point for monitoring and management.

The inlet, outlet, overflow and scour pipework will be installed in excavated trenches between the BPT and the site boundary / connection points. Pipework trenches will be backfilled using suitable material and reinstated to avoid the creation of preferential drainage pathways through the bog. Impermeable wraps or equivalent hydraulic control measures will be installed where required to maintain existing hydrological conditions and prevent preferential flow paths along pipe trenches. Flowmeter chambers, valve chambers, the inspection / collection chamber and associated ducting will be installed in parallel with the pipework works.

Foundations or concrete plinths will be constructed for the scour extraction kiosk and control kiosk. Electrical ducting and control / telemetry connections will be installed between the chambers, kiosks and power connection point. A new ESB connection will be provided to serve instrumentation, telemetry and lighting, subject to ESB Networks requirements. Works associated with the ESB connection will be undertaken in accordance with the requirements of ESB Networks and the relevant construction management controls.

Construction within the bog habitat will be undertaken using appropriate low-impact methods. Bog mats, temporary ground protection and low-ground-pressure plant will be used where practicable to reduce rutting, compaction and disturbance. Plant and materials will be stored only within designated areas. Fuels, oils, cementitious materials, concrete washout, chemicals and other potentially polluting materials will be managed in accordance with the pollution prevention measures set out in the CEMP (Section 1.3.4.1). Concrete washout will not be permitted on unprotected ground.

Site-specific ecological supervision will be provided where required by the CEMP and biodiversity mitigation measures (see Section 1.3.4). A suitably qualified ECoW will oversee sensitive works, including peat stripping, habitat protection, reinstatement and any works with potential to affect bog hydrology or ecological receptors. The Appointed Contractor will implement measures to prevent sediment runoff, uncontrolled drainage, fuel or chemical spillages, and damage to retained bog habitat.

Following completion of the structural, pipework, kiosk, power and telemetry works, the BPT and associated infrastructure will be tested and commissioned. Commissioning will include hydraulic testing, pressure testing where applicable, verification of flowmeter and valve operation, telemetry and alarm testing, scour extraction arrangements and confirmation that the BPT can operate as part of the treated water transfer system between Bonniconlon BPS and Lough Talt WTP.

On completion of the construction works, temporary working areas will be removed and disturbed areas will be reinstated. The original peat and salvaged peat turves will be reinstated, where practicable, to match surrounding levels and support natural recolonisation by bog vegetation. Reinstated peat surfaces will be lightly consolidated and wetted where required to support vegetation recovery. Temporary drains or channels created during construction will be backfilled or blocked as appropriate to restore existing hydrological conditions and avoid long-term drainage effects. Landscaping and habitat reinstatement measures will be implemented in accordance with the CEMP, CRWMP and the landscaping and biodiversity proposals included in the submitted EIAR (see Section 1.3.4) and this NIS.

The works at Windy Gap BPT are anticipated to take approximately eight months to complete, subject to weather, ground conditions, ecological constraints, construction logistics and commissioning requirements. The works may be undertaken in stages and are not necessarily sequential. Construction and commissioning of the Windy Gap BPT will be required before the cessation of abstraction from Lough Talt and before works at Lough Talt WTP that are dependent on the availability of the proposed treated water transfer system.

#### 1.2.7.3 Operation and Maintenance

The Windy Gap BPT will operate as a break pressure and hydraulic control asset within the treated water transfer system between Bonniconlon BPS and Lough Talt WTP. The BPT will operate continuously while the treated water transfer system is in service, with inflow and outflow governed by the upstream pumping regime, downstream hydraulic conditions and operational requirements.

Monitoring of the BPT will be provided through flow, level and pressure instrumentation connected to the site control and telemetry systems. The control and telemetry systems will support remote monitoring of tank levels, flow rates, valve status, alarms and abnormal operating conditions. The BPT will form part of the wider treated water network control strategy and will support continuity of supply to the Lough Talt supply area.

Routine operation and maintenance will include operator attendance, visual inspections, functional checks and planned preventative maintenance of the BPT, inlet and outlet pipework, overflow and scour arrangements, flowmeter chamber, valve chambers, inspection / collection chamber, scour extraction kiosk, control kiosk, telemetry equipment, power supply, fencing, access arrangements and hardstanding.

The scour arrangement will be maintained to allow controlled removal of settled material and drainage of the BPT where required for inspection, cleaning or maintenance. Scour activities will be undertaken in accordance with Uisce Éireann operational procedures and the scour management proposals set out in Section 1.9. Scoured water will be removed from site by tanker or otherwise managed in accordance with the approved operational procedure and relevant environmental controls.

The inspection / collection chamber associated with the impermeable envelope and wrapped perforated drainage system will be inspected periodically to monitor for any leakage from the BPT or associated below-ground pipework. Any water collected within the inspection / collection chamber will be managed in accordance with Uisce Éireann operational procedures and environmental requirements.

Given the bog habitat setting, operational maintenance will also include inspection of reinstated peat surfaces, local ground conditions, access arrangements and any areas where settlement, erosion, rutting, compaction, ponding or preferential drainage could occur. Any remedial works will be undertaken in a manner that maintains the surrounding bog hydrology and avoids unnecessary disturbance to retained peat and vegetation.

No permanent welfare facilities or foul drainage infrastructure are proposed at Windy Gap BPT. Operational access will be via the existing Bunnyconnellan Wind Farm access road from the R294. Routine operational

traffic is expected to be limited and will generally comprise operator inspections, maintenance visits, specialist contractor attendance and tanker access where required for scour extraction or maintenance activities.

## 1.2.8 Lough Talt WTP

### 1.2.8.1 Existing Lough Talt WTP Site

The site comprises the existing Lough Talt Water Treatment Plant (WTP) which consists of a Control building, a disused Microstrainer building, chemical storage tanks, Chlorine contact tank and other associated process units and infrastructure.

The site is accessed via a shared vehicular entrance on the east of the site, which also provides access to the Coillte lands to north (Figure 1-28). There is an existing gated access to the south of the site boundary however, this is no longer in use. The site runs parallel to the R294 which bounds the site to the south. The site is separated from the roadway by an approx. 2 m high wire fence which runs along the perimeter of the entire WTP site. The overall site is topographically flat in nature, however the site sits above the level of the road, with the site falling towards the road along the boundary (Figure 1-29). The lands to the north of the site rise north along the ridge line which travels northeast. The site is located approx. 250 m southeast of Lough Talt.



**Figure 1-28 — Existing Lough Talt WTP site (from entrance)**



**Figure 1-29 — Existing Lough Talt WTP site**

No works are proposed to the existing abstraction point from Lough Talt, which is not located within the Lough Talt WTP site or the Red Line Boundary. The cessation of abstraction from Lough Talt will be achieved by closing a control valve within the abstraction arrangement located adjacent to the carpark at Lough Talt.

The existing layout at Lough Talt WTP site is shown in Figure 1-30 and comprises the following:

- Control Building;
- Microstrainer Building – disused;
- Rapid Gravity Filtration units, backwash holding tank, pumps and associated works;
- Raw Water Feed Container, Raw Water Balance Tank and associated works;
- Containerised UV unit and associated works;
- Chemical storage container, tanks and associated works;
- Chlorine Contact Tank;
- Disinfection (chlorination and ammonia) and orthophosphate dosing units and associated works;
- Used Wash Water Equalisation Settlement Tank (UWWEST), Settlement tanks, Sludge holding tank and associated works; and,
- Attenuation Pond.

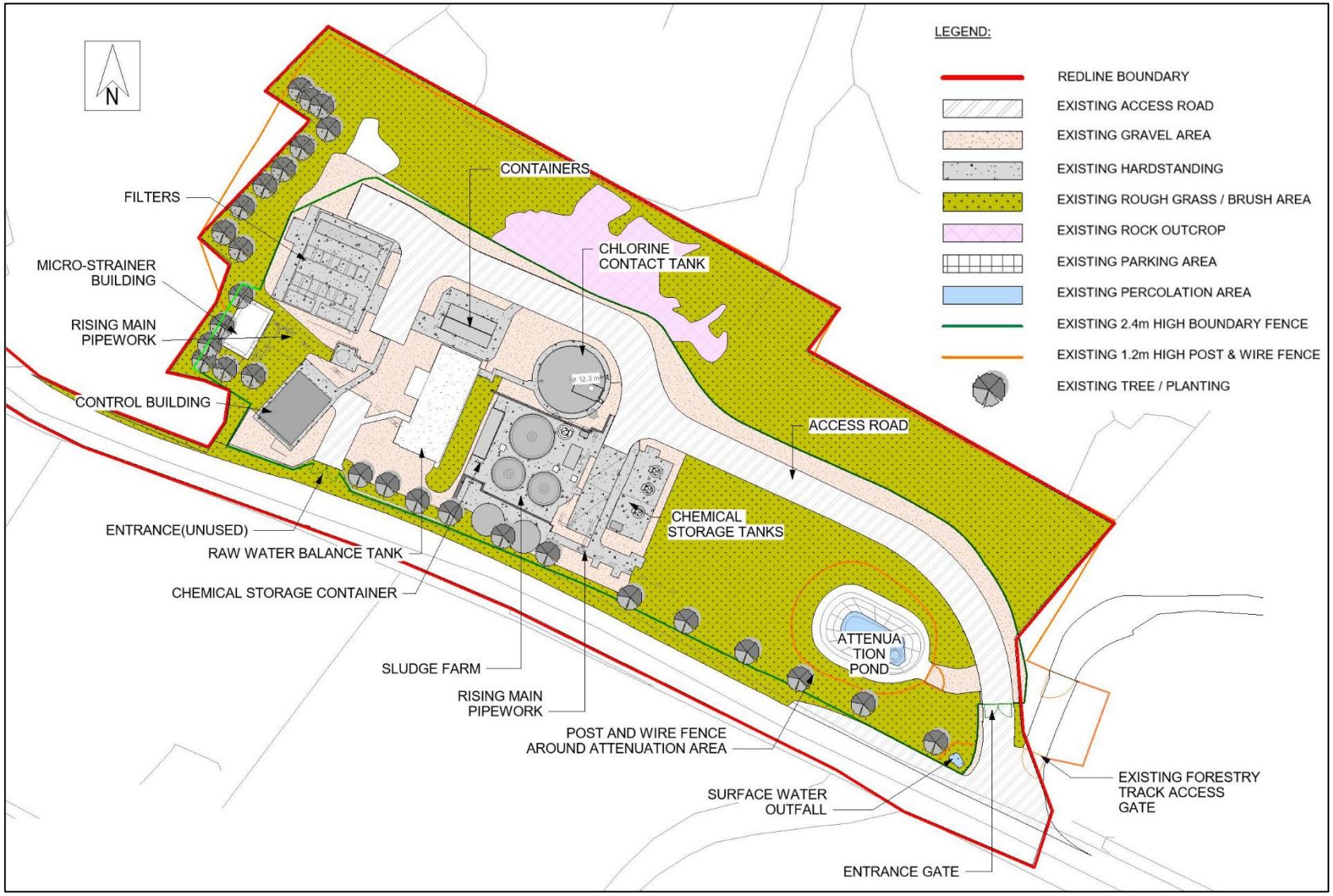



**Figure 1-30 — Existing Layout at Lough Talt WTP site**

### 1.2.8.2 Proposed Repurposing of Lough Talt WTP

The existing Lough Talt site will be repurposed as part of the Proposed Development. The existing storage at Lough Talt WTP is limited and hence a new treated water reservoir with increased storage is required to improve water security and water quality for the Lough Talt RWSS area.

#### 1.2.8.2.1 New and repurposed infrastructure

As part of repurposing of Lough Talt WTP, new infrastructure, repurposing of existing infrastructure (Figure 1-31), retention of existing infrastructure, removal and decommissioning of existing redundant infrastructure (Figure 1-32) and ancillary works are proposed, as follows:

- New infrastructure:
  - A new treated water reservoir of approx. 3,300 $m^3$ capacity and associated works; and
  - Installation of roof mounted solar panels.
- Repurposed existing infrastructure:
  - Repurposing of existing approx. 330 $m^3$ chlorine contact tank as reservoir.
- Retained existing infrastructure:
  - Control building;
  - Chemical storage container, tanks and associated works; and
  - Disinfection (chlorination and ammonia) and orthophosphate dosing infrastructure.
- Ancillary site development works, including alterations to access road, hardstanding, surface water management, wastewater management, site lighting, fencing and landscaping.

#### 1.2.8.2.2 Removal / demolition works

As part of site repurposing, the following existing infrastructure (items, surfaces) will be decommissioned, removed / demolished:

- Section of existing access road overlapping the footprint of the proposed new treated water storage tank;
- Containerised filtered water pumps (Ref. No. 1, Figure 1-32);
- Two filter banks (Ref. Nos. 2 and 3, Figure 1-32);
- Backwash holding tank (Ref. No. 4, Figure 1-32);
- Containerised backwash pumps (Ref. No. 5, Figure 1-32);
- Micro-strainer building (Ref. No. 6, Figure 1-32);
- Inlet valve chamber (Ref. No. 7, Figure 1-32);
- Three Kiosks (Ref. Nos. 8, 16 and 17, Figure 1-32);
- Chemical tank (Ref. No. 9, Figure 1-32);
- Containerised UV unit (Ref. No. 10, Figure 1-32);
- Raw water feed container (Ref. No. 11, Figure 1-32);
- Raw water balance tank (Ref. No. 12, Figure 1-32);
- UWWEST tank (Ref. No. 13, Figure 1-32);
- Settlement tank (Ref. No. 14, Figure 1-32);
- Sludge holding tank (Ref. No. 15, Figure 1-32);
- Associated works with removal and demolition of the above; and
- Existing fenceline (purple line, Figure 1-32).

These are shown in Figure 1-32.

Demolition waste material generated (approx. 375 $m^3$) at the Lough Talt WTP site will consist largely of concrete and block which can be recycled under an Article 28 application. The road surface (approx. 95 $m^3$) to be removed will be sent to a reclaimed asphalt pavement (RAP) plant for re-use, if suitable.

An asbestos survey was carried out by OHSS in March 2025 to provide sufficient information for designers and the project supervisor for design process to take account of identified asbestos risks. No asbestos containing materials (ACMs) were identified at the Lough Talt WTP. Nevertheless and as appropriate, the Appointed Contractor will conduct an asbestos survey to guide site clearance and ensure safe removal of asbestos before any construction or demolition begins. It is estimated that 1,200 tonnes of concrete waste will be generated from demolition work, reservoir construction, foundations etc. Suitable demolition concrete will be removed from site by a licenced contractor and transferred to a facility for recovery if the end of waste criteria are met. This will be done under an Article 28.

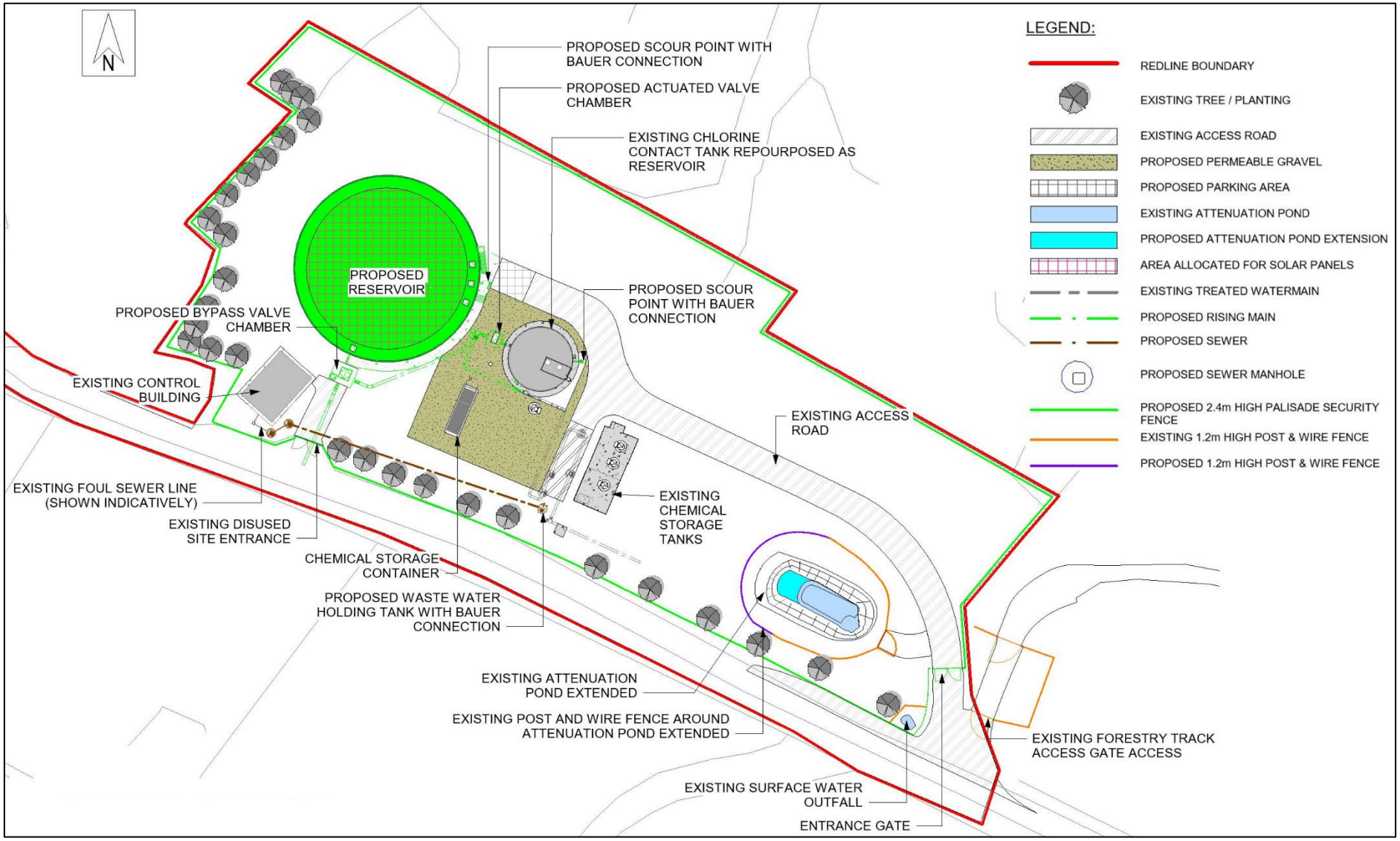



**Figure 1-31 — Proposed Layout at Lough Talt WTP**

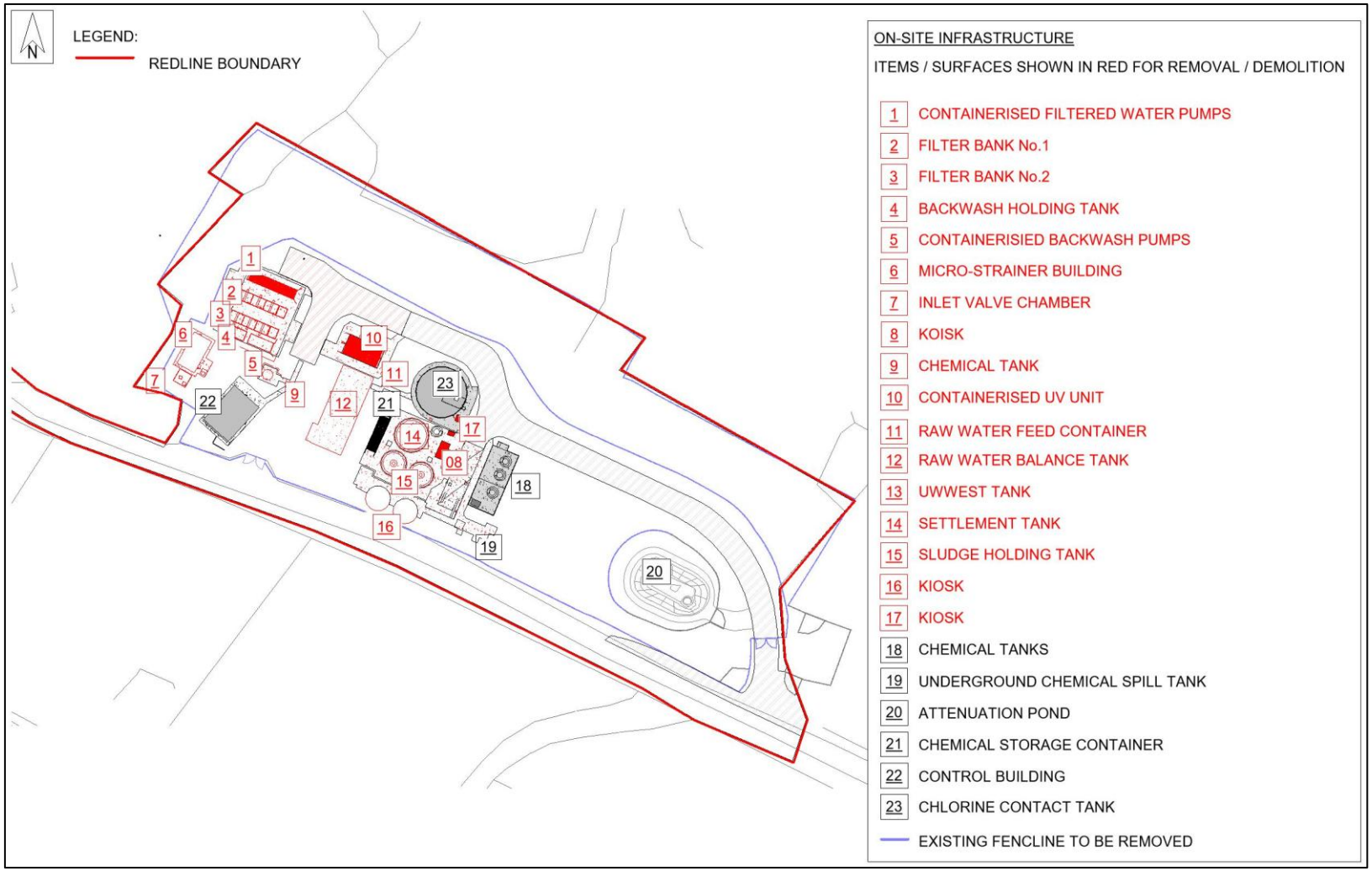



**Figure 1-32 — Proposed Layout showing removal and decommissioning of existing redundant infrastructure at Lough Talt WTP**

The new treated water reservoir will be located westwards away from the mountains as far as possible to minimise excavation in mountains. The reservoir will be above ground as site investigation results indicated the presence of shallow bedrock in the area. The top of the tank will be 133 m OD. The Pipeline E will be connected into this reservoir with a new bypass arrangement to the repurposed chlorine contact tank. There will be a direct underground pipework from new treated water reservoir to the repurposed chlorine contact tank. A new scour point with Bauer connection will be provided at both the new reservoir and repurposed tank. The existing outlet pipeline from the repurposed chlorine contact is deemed sufficient to supply to the Lough Talt RWSS.

Upon commissioning of the Proposed Development, abstraction from Lough Talt will cease and Lough Talt WTP will receive treated water from Pipeline E. The relevant existing water treatment facilities will be retained and dosing will be adjusted as necessary to account for the new supply.

#### 1.2.8.2.3 Power supply and Renewable Energy

The existing power supply is deemed sufficient for the proposed works at the site and hence no alterations to existing power supply is envisaged.

Solar panels will be installed on the roof of the new storage tank to supplement the power requirements of the site. Additional details are provided in Section 1.5.

#### 1.2.8.2.4 Ancillary Works

**Access Road**

The existing access road will be retained, except for a small area to the western end of the site where it overlaps with the footprint of the new storage tank – this section will be demolished. A new asphalt road with an area of approx. 80 $m^2$ will be provided around the existing chlorine contact tank to facilitate vehicle manoeuvring. Hardstanding will be provided at the eastern side of the new treated water reservoir.

The only access to site is via the existing access road on the eastern side of the Lough Talt WTP site. The access via the south western entrance is no longer used.

**Fencing**

New 2.4 m high palisade security fencing will be installed all around the site. The existing 1.8 m high post and wire mesh fencing will be removed.

**Stormwater Management**

The existing network consists of a conventional drainage network, which includes road gullies, pipe network with manholes for maintenance. The pipe network conveys the surface water to the existing attenuation pond located at the southeast corner of the site. The surface water is collected in an attenuation pond and is discharged from the site to the existing outfall near the eastern corner of the site. The existing flow control device located downstream from the attenuation pond restricts the flow of surface water to pre-development runoff rate. This results in the surface water backing up and gradually filling the attenuation pond to a pre-determined level. The existing attenuation pond is sized to cater for extreme rainfall events.

It is anticipated that the Proposed Development will result in a small increase in surface water entering the system, therefore the attenuation pond will be extended (approx. 8%) to enable the same discharge rate from the site to be maintained. New pipe network and gullies will be installed within the site to collect surface runoff from new impermeable areas.

**Wastewater management**

An existing septic tank is located near the south-western end of the site. As part of the proposed works, wastewater flows from the retained welfare facilities will be diverted to a new wastewater manhole or holding

arrangement fitted with a Bauer connection. Wastewater will be collected and removed from site by tanker for treatment at an appropriately authorised facility. Any redundant wastewater infrastructure affected by the works will be isolated or decommissioned.

**Site Lighting**
Low level bollards will be installed along the access road and paths to allow for a safe access to site. Wall mounted luminaires will be installed on the tank to light the plinth.

**Landscaping**
This site will likely need input of additional soil excavated from elsewhere on the Proposed Development due to poor local soil quality.

Approximately 120 m of hedgerow will be provided along the fence on southern boundary of the site. Areas where tanks and hard surfaces have been removed will be sowed as grassland area and managed with a reduced mowing regime.

The Lough Talt WTP site will be planted with woodland mix where possible. This includes around new and retained tanks, as well as around the attenuation pond.

Additional hedging with standard trees will be planted at the entrance road (avoiding buried pipes), to the southeast and to the west of the expanded attenuation pond.

### 1.2.8.3 Construction and Demolition Works

The existing Lough Talt abstraction and treatment system currently supplies potable water to the Lough Talt RWSS. The main reconfiguration works at Lough Talt WTP will therefore be planned and sequenced to maintain continuity of supply to the Lough Talt supply area. Works that are dependent on the availability of the proposed treated water transfer system will not be undertaken until the upstream scheme elements, including Lisglennon RWS&PS, Lisglennon WTP, Bonniconlon BPS, Windy Gap BPT and Pipelines A to E, have been constructed, tested and are available for commissioning. Limited enabling works may be undertaken in advance where they do not compromise the continued operation of the existing Lough Talt abstraction and treatment system.

The construction works at Lough Talt WTP will comprise the reconfiguration of the existing WTP site to operate as a treated water storage and conditioning facility following cessation of abstraction from Lough Talt. The works will include connection of Pipeline E to the new reservoir and the repurposed chlorine contact tank, retained site infrastructure, construction of a new treated water storage tank, repurposing of retained treatment assets, decommissioning and removal of redundant process equipment, alterations to access roads and site drainage, site lighting, wastewater management and implementation of landscaping and biodiversity enhancement measures.

The final construction methodology, phasing, temporary works arrangements and commissioning sequence will be confirmed by the Appointed Contractor during detailed design and construction planning and will be implemented in accordance with the relevant construction management plans (see Section 1.3.4).

Initial activities will include site establishment, set-up of temporary working areas, confirmation and protection of existing operational assets, buried services, access routes and drainage infrastructure, and implementation of temporary traffic management measures where required. Retained operational infrastructure, including the existing chlorine contact tank, chemical dosing systems, site control systems, power supply, drainage systems and access arrangements, will be identified and protected prior to intrusive works.

Following availability of the proposed treated water transfer system, Pipeline E will be connected to the retained Lough Talt WTP infrastructure. The existing chlorine contact tank will be retained and repurposed as part of the treated water storage and conditioning arrangement. Treated water received from the new supply will be introduced in a controlled manner, with associated pipework, valving, instrumentation and control systems tested and commissioned. Chemical dosing systems retained at the site, including chlorination, ammonia dosing, orthophosphate dosing and pH correction, will be adjusted as required to suit the incoming treated water quality and operational requirements.

The cessation of abstraction from Lough Talt will be coordinated with commissioning of the proposed treated water transfer system and confirmation that the retained Lough Talt WTP infrastructure can operate as part of the new supply arrangement. Once the supply switchover has been completed, redundant raw water abstraction and treatment processes will be isolated, drained, decommissioned and made safe in accordance with the decommissioning strategy and relevant Uisce Éireann operational procedures.

The section of existing access road that overlaps with the footprint of the proposed new treated water storage tank will be removed. Demolition and removal works will be undertaken in a controlled manner using suitable mechanical plant and hand tools where required. Materials generated during demolition will be segregated, tested where necessary, and managed in accordance with the CRWMP. Reusable or recyclable materials will be recovered where practicable, and any surplus or unsuitable material will be transported to an appropriately authorised facility for recovery, treatment or disposal.

Redundant treatment process units and associated mechanical, electrical, instrumentation, control and automation equipment will be isolated, made safe and removed where required. Existing assets to be retained will be protected throughout the works. Temporary isolations, tie-ins and modifications to live systems will be planned in advance and undertaken in accordance with method statements, risk assessments, isolation procedures and commissioning plans agreed with Uisce Éireann Operations.

Excavations at the Lough Talt WTP site are anticipated to be limited due to the presence of shallow bedrock. The new treated water storage tank will be constructed predominantly above ground on prepared foundations. Excavation will be required locally for foundations, pipework, chambers, drainage alterations, ducting and road reinstatement. Excavated material will be managed in accordance with the CRWMP, with suitable material re-used on site where practicable for backfilling, grading and landscaping, subject to geotechnical suitability and environmental testing.

The new treated water storage tank will be constructed as a reinforced concrete tank, precast tank system or equivalent structure suitable for the site conditions and operational requirements. Foundations will be formed to the required level, including blinding and reinforcement as required. The tank will then be constructed or assembled, with associated inlet, outlet, overflow, scour, washout, access, ventilation and inspection arrangements installed in accordance with the final detailed design.

Associated pipework and chambers will be installed to connect Pipeline E, the retained chlorine contact tank, the new treated water storage tank, chemical dosing systems and the downstream distribution network. Flowmeter chambers, valve chambers, scour arrangements, electrical ducting and control / telemetry interfaces will be installed as required. The works will be sequenced to allow the new and retained assets to be integrated into the revised hydraulic and operational arrangement while maintaining safe access and protecting retained infrastructure.

Alterations to the site access road, hardstanding, drainage network and attenuation pond will be undertaken as part of the civil works. The new asphalt access road around the retained chlorine contact tank will be constructed to facilitate operational access and vehicle manoeuvring. The existing drainage network will be modified where required to accommodate the new impermeable areas, with runoff conveyed through the proposed drainage

system and attenuation measures. Surface water management measures during construction will be implemented in accordance with the CEMP (see Section 1.3.4.1) and final drainage design.

The existing wastewater arrangements will be modified as required to reflect the future operational use of the site. Wastewater flows from welfare facilities will be diverted to a new wastewater manhole or holding arrangement with tanker connection, where required by the final design. Any existing septic tank or redundant wastewater infrastructure affected by the works will be decommissioned or isolated in accordance with relevant environmental and health and safety requirements.

Where works require modification or relocation of existing utilities, including any ESB pole, stay or associated service, these works will be confirmed during detailed design and undertaken in consultation with the relevant utility provider. Such works will be planned to maintain safe working conditions and avoid unnecessary disruption to site operations or public infrastructure.

Following completion of structural, pipework, drainage, road, Mechanical, Electrical, Instrumentation, Control and Automation (MEICA) and utility works, the upgraded Lough Talt WTP site will be tested and commissioned. Commissioning will include hydraulic testing, pressure testing where applicable, disinfection, flushing, verification of tank levels and operational controls, flowmeter and valve testing, chemical dosing verification, telemetry and alarm testing, and confirmation that the site can operate as a treated water storage and conditioning facility within the wider supply system.

On completion of the principal works, temporary working areas, construction plant, temporary access arrangements and redundant temporary works will be removed. Disturbed areas will be reinstated, boundary features restored where practicable, and landscaping and biodiversity enhancement measures implemented in accordance with the CEMP, (see Section 1.3.4) and the landscaping and biodiversity proposals included in this application.

The works at Lough Talt WTP are anticipated to take approximately two to three months to complete. The works may be undertaken in stages and are not necessarily sequential, subject to programme, commissioning requirements, continuity of supply constraints, construction logistics and coordination with other elements of the Proposed Development.

#### 1.2.8.4 Operation and Maintenance

Following completion of the Proposed Development and cessation of abstraction from Lough Talt, the Lough Talt WTP site will operate as a WTP with increased treated water storage within the regional water supply network. Treated water will be supplied to the site via Pipeline E from the Windy Gap BPT and will be stored within the new treated water storage tank and repurposed chlorine contact tank prior to distribution to the Lough Talt supply area.

The site will provide treated water storage, operational balancing and final water quality conditioning. Operation will include management of storage levels, tank turnover, hydraulic conditions and water quality within the retained and new storage infrastructure. The retained chemical dosing systems, including chlorination, ammonia dosing, orthophosphate dosing and pH correction, will be adjusted and operated as required to maintain the required treated water quality, disinfectant residual and network stability.

Operation of the site will be supported by instrumentation, telemetry and remote monitoring. Key operational parameters, including storage levels, flows, dosing status, alarms and water quality monitoring points, will be monitored through the site control and telemetry systems and integrated into the wider network control strategy. Operator attendance will be provided as required for routine checks, sampling, inspection, maintenance, chemical management and response to operational alarms.

Routine operation and maintenance will include visual inspections, planned preventative maintenance and functional checks of the treated water storage tanks, retained chlorine contact tank / storage infrastructure, pipework, valves, flowmeters, chemical storage and dosing systems, control panels, instrumentation, telemetry equipment, access arrangements, fencing, lighting, drainage infrastructure and site security systems. Maintenance will be undertaken in accordance with Uisce Éireann operational procedures, manufacturer requirements and relevant health, safety and environmental controls.

Chemical storage and dosing infrastructure will be inspected and maintained to confirm continued safe operation. This will include inspection of bunded areas, tanks, dosing pumps, pipework, transfer points, dosing lines, alarms and emergency response equipment. Chemical deliveries and storage will be managed in accordance with Uisce Éireann procedures and applicable environmental and health and safety requirements. The scour, overflow, washout and drainage arrangements associated with the treated water storage infrastructure will be inspected and maintained to allow controlled tank cleaning, inspection, maintenance and emergency drawdown where required. Water generated during operational maintenance, tank cleaning, flushing, scour or washout activities will be managed in accordance with Uisce Éireann operational procedures, the scour management proposals set out in Section 1.8 and relevant environmental controls.

Surface water drainage infrastructure, including gullies, pipework, manholes, flow control features and attenuation pond, will be inspected and maintained to ensure continued performance. Foul drainage infrastructure, including any retained or new wastewater holding / tanker connection arrangement, will be operated and maintained in accordance with Uisce Éireann requirements and relevant environmental controls.

Operational access will continue via the existing site entrance. Routine operational traffic will generally comprise operator visits, sampling and inspection visits, maintenance vehicles, chemical deliveries, specialist contractor attendance and tanker movements where required for wastewater or maintenance-related activities. The access road, hardstanding, fencing, lighting, landscaping and biodiversity enhancement areas will be maintained as part of routine site operations.

The Lough Talt WTP site will be operated as part of the wider treated water supply system to support continuity of supply, operational resilience, water quality compliance and long-term asset performance.

## 1.2.9 New Bonniconlon Reservoir

### 1.2.9.1 Existing site

The site is located off the L51172 at Bonniconlon West, in the vicinity of a junction with a private access road, west of the L5117. The surrounding area is predominantly rural and agricultural in character, with a number of residential properties located in the wider vicinity.

The existing Bonniconlon Reservoir (Figure 1-33) has a storage capacity of approximately 60 m³ and is supplied from the existing treated water network fed from Lisglennon WTP via Behy Road WPS and Rathreedane Pumping Station. An existing inlet pipe tees off the treated water main and discharges to an inlet chamber before entering the reservoir. Flow into the reservoir is controlled by a ball valve arrangement within the inlet chamber. The existing reservoir has a Top Water Level (TWL) of approximately 95.63 m OD. Treated water from the reservoir discharges back to the existing 225 mm watermain. An existing overflow pipe drains to a nearby field drain.

Bulk meters are provided on the inlet and outlet pipework within the existing reservoir site. An existing water quality sampling kiosk, including a sampling pump, is also provided and transmits chlorine residual and turbidity

monitoring data to Lisglennon WTP through the existing monitoring and communications system. A site layout is shown in Figure 1-34.



**Figure 1-33 — Bonniconlon Reservoir – Existing Site**

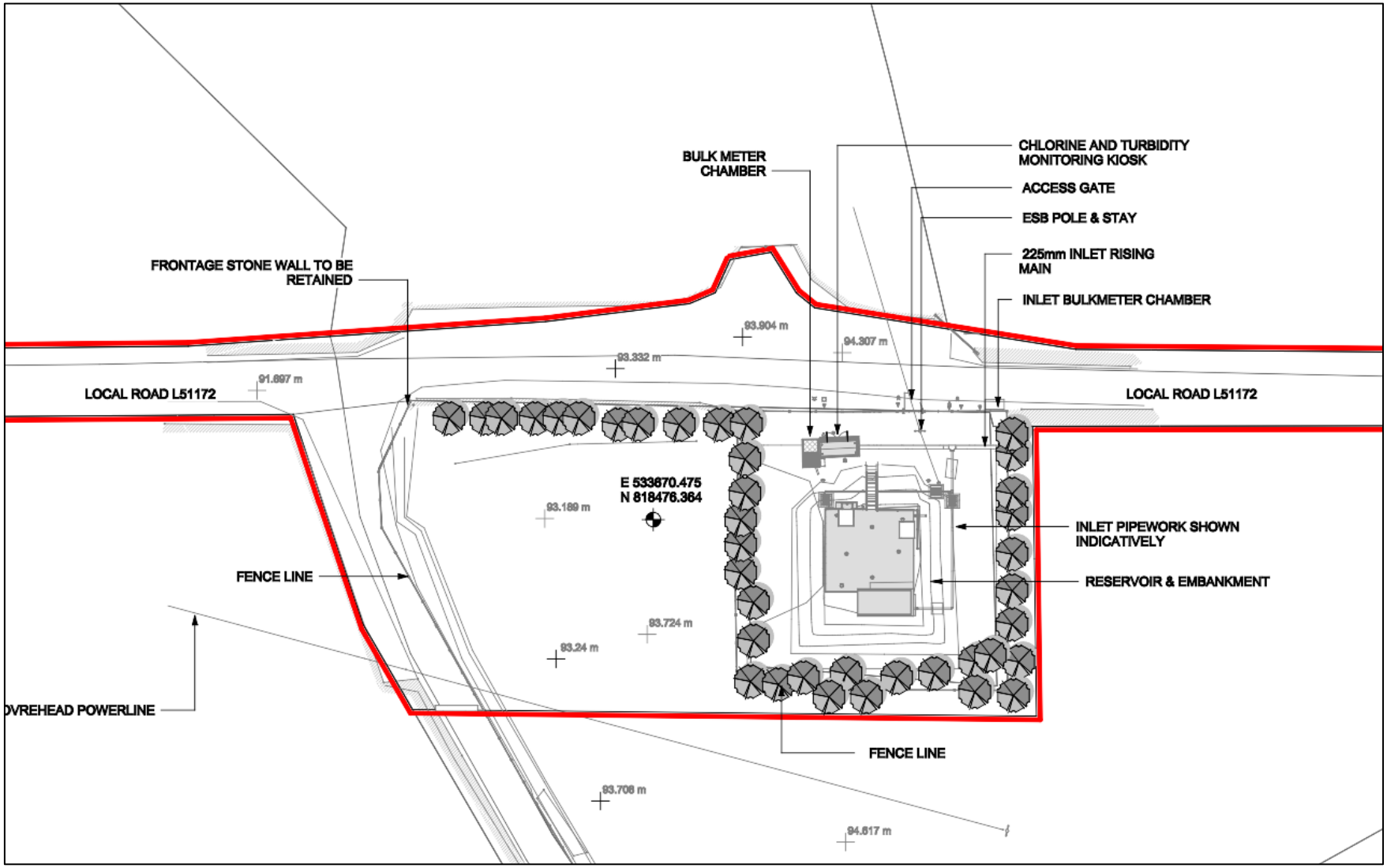



**Figure 1-34 - Bonniconlon Reservoir Existing Site Layout**

### 1.2.9.2 Proposed Reservoir

In order to improve the water security of the Bonniconlon area, a new reservoir is required. This reservoir will be fed by the existing network that supplies to Bonniconlon. While Pipeline D will be laid in the L51172 adjacent to the site, the new treated water pipeline will not supply this site.

The proposed works will consist of:

- A new reservoir approx. capacity of 185 $m^3$ and associated works;
- New dechlorination chamber;
- Relocation of ESB pole; and
- Ancillary site development works, including alterations to access arrangements, hardstanding, surface water management, site lighting, fencing, security, landscaping works.

A proposed site layout is shown in Figure 1-35, and a typical 3D view of the proposed upgrades are shown in Figure 1-36.

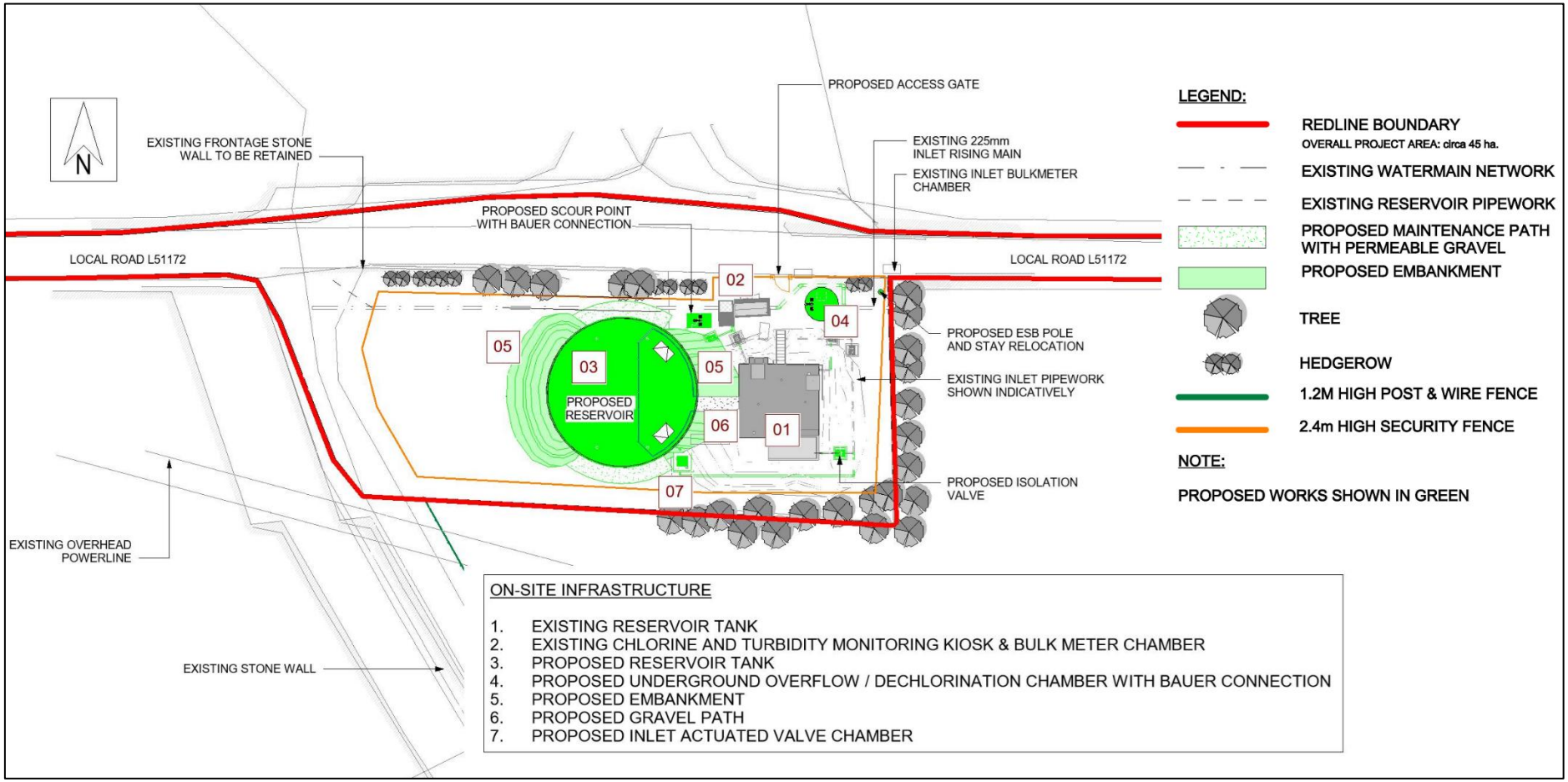



**Figure 1-35 — Bonniconlon Reservoir Proposed Upgrades Site Layout**

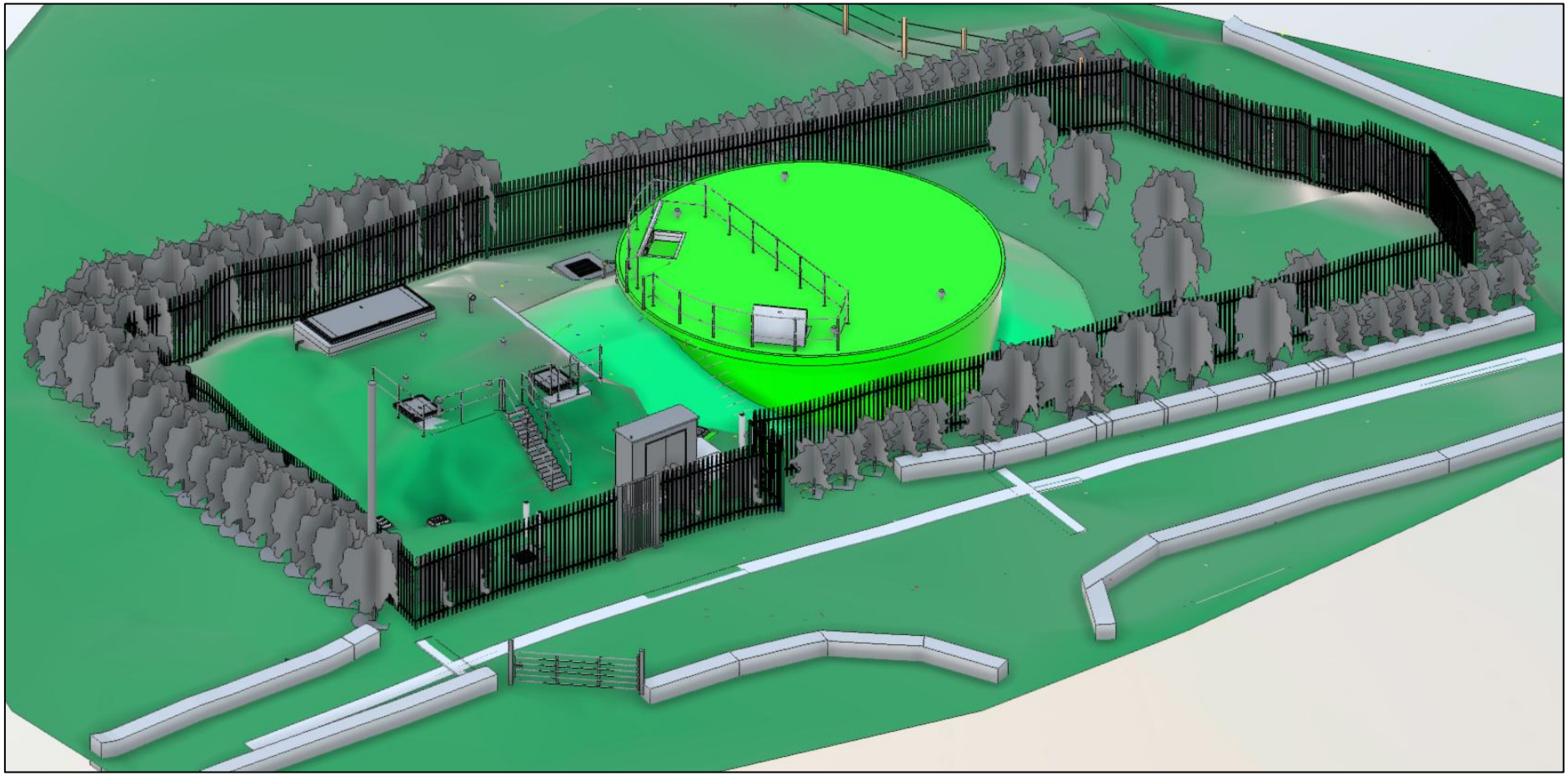


**Figure 1-36 — Bonniconlon Reservoir Proposed Upgrades – A Typical 3D view**

The proposed treated water storage reservoir will have a working storage volume of approx. 185 $m^3$, with indicative dimensions of approx. 11 m diameter and 2.5 m height, including freeboard. It will operate in parallel with the existing treated water storage reservoir to provide a twin-cell storage arrangement, improving operational resilience, flexibility and security of supply.

The existing inlet main will be extended to serve the proposed reservoir. The inlet arrangement will be designed to support balanced flow distribution between the existing and proposed reservoir cells under normal operating conditions. The TWL of the proposed reservoir will be hydraulically matched to that of the existing reservoir, approximately 95.63 m OD, to support balanced filling and drawdown and to avoid preferential operation of either cell.

The proposed reservoir will be provided with a dedicated outlet pipe connecting to the existing outlet pipeline via the retained bulk meter chamber. An overflow level sensor will be installed within the proposed reservoir and connected to the existing monitoring and telemetry system. The inlet and outlet pipework will be configured to allow controlled drain-down, isolation and bypass of either reservoir cell for inspection, cleaning or maintenance, while maintaining supply through the other cell where practicable.

A new dechlorination chamber is proposed in the north-eastern part of the site and will connect to the existing reservoir overflow arrangement. The chamber will be accessible for routine inspection, emptying and maintenance, as required.

No upgrade to the existing power supply is proposed as it is anticipated to be sufficient to supply the proposed extension of the site. The existing ESB pole will be relocated to facilitate the installation of the dechlorination chamber.

#### 1.2.9.2.1 Ancillary Works

**Access Road and Pavement**
Access and egress to site is through the L51172 local road. Temporary site access for construction will be required via the private lane to the southwest of the site. A gravel path for pedestrian access will be provided on the top of the berm between the reservoirs.

**Fencing / Boundary**
A new 1.2 m high post and wire mesh fence will be installed along the west boundary and a portion of the south boundary of the site. The existing 1.2 m high post and wire mesh will be joined to the new fence. The existing frontage wall will be retained. Stone ditch and corner ditch stone will be retained.

**Stormwater Management**
There is minimal surface runoff from the proposed works. Stormwater generated from the new tank roof will be collected into a French drain circling the base of the proposed tank's berm, which will be consist of a shallow trench with single sized free draining stones wrapped in geotextile. Stormwater will percolate into the ground.

**Site Lighting**
Low level bollards will be installed along the access path between the reservoirs to allow for a safe access to site. Internal ceiling mounted luminaire will be installed in the existing kiosk. Handrail linear luminaire will be installed to light the stairs leading to existing reservoir. Refer to Section 1.8 for overall site lighting for the Proposed Development.

**Landscaping**
The existing reservoir site is surrounded by mature trees while the adjacent greenfield site where the new reservoir will be located comprises of overgrown grassland.

Evergreen trees and/or shrubs native to the area will be instated as a hedgerow along the site boundary fence to screen off the site infrastructure. The hedgerow will be allowed to rewild and grow unrestricted to provide biodiversity enhancement to the agricultural grassland site.

Frontage wall will be retained and restored where necessary, with woodland mix to be planted. It is anticipated that the boundary to the south will need to be removed during construction to facilitate site access and installation of the tank. This will be replanted with woodland mix.

Planting to the north and east will be retained as much as possible. Space between the existing and new tanks has been minimised in the design as much as possible. The ground will be graded and sloped up to the tank.

A section of hawthorn hedgerow (approx. 10 m) will be removed between the existing and new tanks (west of existing tank).

Stone ditch and corner ditch stone will be retained.

### 1.2.9.3 Construction Works

The existing Bonniconlon Reservoir will remain operational throughout the construction works, insofar as practicable. The works will be planned and sequenced to maintain continuity of supply to the Bonniconlon supply area during construction, testing and commissioning. Where temporary isolations, tie-ins or operational constraints are required, these will be planned in advance and agreed with Uisce Éireann Operations.

The construction works will comprise site establishment, creation of temporary working areas, vegetation clearance, formation of temporary construction access, excavation and ground preparation, construction of the new treated water storage reservoir, installation of associated pipework, chambers, instrumentation and ducting, integration with the existing reservoir and network, construction of the dechlorination chamber, reinstatement of boundary features, and landscaping and biodiversity enhancement works.

The final construction methodology, phasing and temporary works arrangements will be confirmed by the Appointed Contractor during detailed design and construction planning. Any refinements will remain within the project description, design parameters and environmental assessments submitted with this application and will be implemented in accordance with the CEMP, Traffic Management Plan, CRWMP and other relevant construction management plans (see Section 1.3.4).

Initial works will include site establishment, demarcation of the construction working area, confirmation and protection of existing operational assets, buried services, boundary features, mature vegetation and drainage features, and implementation of temporary traffic management measures where required. A temporary site compound and temporary working area will be established within the identified construction area, as described in Section 1.3.6. Construction access will be taken from the private lane to the south-west of the site, subject to landowner agreement and the traffic management measures set out in the Contractor's Traffic Management Plan. On completion of the works, temporary access arrangements will be removed and affected boundaries reinstated.

Vegetation clearance will be limited to that required to facilitate safe construction access, reservoir installation, pipework connections and boundary works. Existing boundary features, mature trees and retained planting will be protected where practicable. Where hedgerow, trees or scrub require removal, this will be undertaken in

accordance with the CEMP (see Section 1.3.4.1), ecological mitigation measures and any seasonal constraints identified in the biodiversity assessment.

Excavation and ground grading will then be undertaken to form the reservoir platform, pipework trenches, chambers and associated working areas. Based on the current design, excavation depths at the site are anticipated to be approx. 2 m bgl on average, although depths will vary locally depending on final formation levels, foundation requirements, pipework cover, chamber depths and ground conditions. Estimated volumes are provided in Section 1.6. Topsoil and subsoil will be stripped separately and stored in designated stockpile areas for potential re-use. Excavated material will be managed in accordance with the CRWMP (see Section 1.3.4.5). Suitable excavated material will be re-used on site where practicable for backfilling, ground regrading, formation of the reservoir berm and landscaping, subject to geotechnical suitability and environmental testing. Surplus or unsuitable material will be removed from site and transported to an appropriately authorised facility for recovery, treatment or disposal, as appropriate.

The new reservoir will be constructed adjacent to the existing reservoir. The reservoir is anticipated to comprise a precast concrete tank system or equivalent, which may be delivered to site as a complete unit or in sections for assembly on site, subject to final detailed design and transportation requirements. Foundations will be formed to the required level, including blinding and reinforcement or base preparation as required. The tank will then be installed or assembled, with associated inlet, outlet, overflow, scour, washout, access, ventilation, level monitoring and inspection arrangements provided in accordance with the final detailed design.

The existing reservoir will be retained and integrated with the new reservoir to provide a twin-cell treated water storage arrangement. The spacing between the existing and proposed reservoirs will be minimised as far as practicable while allowing for safe construction, inspection, maintenance access and protection of retained assets. The proposed top water level will be hydraulically matched to the existing reservoir to support balanced filling and drawdown.

Associated pipework will be installed in excavated trenches to connect the new reservoir to the existing inlet and outlet arrangements. This will include extension of the existing inlet main, provision of a dedicated outlet pipe, installation of valves, fittings, flowmeter chamber, scour / washout arrangements, overflow connection, level instrumentation and telemetry ducting. The existing bulk meter chamber will be retained and integrated into the revised pipework arrangement, where practicable. Electrical ducting and control / telemetry connections will be installed to the existing kiosk or other appropriate connection point, as confirmed during detailed design.

A new dechlorination chamber will be installed in the north-eastern part of the site to manage overflow water from the existing and proposed reservoir arrangement, where required by the final design. The chamber will be connected to the existing overflow system and will be accessible for inspection and maintenance. Where installation of the dechlorination chamber or associated pipework requires modification or relocation of existing utilities, including any ESB pole, stay or associated service, these works will be confirmed during detailed design and undertaken in consultation with the relevant utility provider.

Surface water generated from the new reservoir roof and associated impermeable areas will be managed through the proposed drainage arrangement, including the French drain around the base of the reservoir berm, where provided. The drainage system will be designed to allow infiltration to ground while avoiding erosion, ponding or uncontrolled runoff to adjoining lands or public roads. Construction-stage water management, sediment control and pollution prevention measures will be implemented in accordance with the CEMP (see Section 1.3.4.1).

Following completion of the structural, pipework, chamber, ducting and instrumentation works, the new reservoir and associated infrastructure will be tested and commissioned. Commissioning will include hydraulic testing, pressure testing where applicable, disinfection, flushing, verification of inlet and outlet operation, valve testing,

level instrumentation and telemetry testing, overflow and scour / washout testing, and confirmation that the new and existing reservoirs can operate together as a twin-cell treated water storage arrangement.

Following commissioning, disturbed areas will be reinstated. This will include regrading around the reservoir, formation of the proposed soil berm, reinstatement of the temporary access area, restoration or repair of the existing frontage wall and boundary features where affected, installation of new fencing and pedestrian access between the existing and proposed reservoir areas, and implementation of landscaping and biodiversity enhancement measures. Planting and reinstatement will be undertaken in accordance with landowner agreements and the landscaping and biodiversity proposals included in the design.

The works are anticipated to take approximately three to four months to complete. The works can be constructed independently of the wider Proposed Development; however, commissioning and integration of the new reservoir into operational service will be coordinated with the availability of a verified treated water supply from Lisglennon WTP. Construction works and traffic management will also be coordinated, where required, with installation of Pipeline D along the L51172 to minimise disruption to local road users, landowners and nearby residents.

#### 1.2.9.4 Operation and Maintenance

The new Bonniconlon Reservoir will operate as a treated water storage asset within the Bonniconlon supply area. It will operate in conjunction with the retained existing reservoir to provide increased storage, operational flexibility and improved resilience of supply. The new and existing reservoirs will operate as a twin-cell treated water storage arrangement, with the proposed top water level hydraulically matched to the existing reservoir to support balanced filling and drawdown.

Inflow, outflow and storage levels governed by upstream supply conditions, downstream network demand and the hydraulic arrangement of the two reservoir cells. Level instrumentation, flow monitoring and overflow alarms will be integrated with the existing telemetry system to support remote monitoring and operational response. The reservoir arrangement will be incorporated into the wider network control strategy for the Bonniconlon supply area.

The inlet, outlet, isolation, overflow, scour and washout arrangements will be operated and maintained to allow either reservoir cell to be isolated, inspected, cleaned or taken out of service while maintaining supply through the other cell, where practicable. This will support planned maintenance and improve operational resilience when compared with the existing single-reservoir arrangement.

Routine operation and maintenance will include operator attendance, visual inspections, planned preventative maintenance and functional checks of the new and retained reservoir assets. This will include inspection and maintenance of tank access points, internal and external surfaces, inlet and outlet pipework, valves, flowmeter chamber, level instrumentation, telemetry equipment, overflow arrangements, scour / washout arrangements, access gates, fencing, lighting, drainage features and landscaped areas.

The reservoirs will be inspected, cleaned and disinfected in accordance with Uisce Éireann operational procedures, drinking water quality requirements and relevant health and safety controls. Any water generated during inspection, cleaning, flushing, scour or washout activities will be managed in accordance with Uisce Éireann operational procedures, the scour management proposals set out in Section 1.9 and relevant environmental controls.

The dechlorination chamber will be inspected and maintained as part of the routine operational maintenance regime. Where overflow water requires management through the dechlorination chamber, it will be treated and

discharged or removed in accordance with the approved operational procedure and relevant environmental requirements. Access to the chamber will be maintained for inspection, emptying and maintenance.

The surface water drainage arrangement, including the French drain around the reservoir berm where provided, will be inspected and maintained to ensure continued infiltration performance and to prevent erosion, ponding or uncontrolled runoff to adjoining lands or public roads. Boundary fencing, the retained frontage wall, access arrangements, pedestrian access between the existing and proposed reservoir areas, landscaping and biodiversity enhancement areas will also be inspected and maintained as part of routine site operations.

Operational access will continue from the L51172 local road, with access to the new reservoir provided through the retained and modified site access arrangements. Routine operational traffic will generally comprise operator inspections, sampling visits, maintenance vehicles, specialist contractor attendance and occasional tanker access where required for scour, washout, cleaning or dechlorination chamber maintenance.

## 1.3 Construction Overview

This section sets out an overview of the key aspects of the construction and operational phases for the Proposed Development.

### 1.3.1 Pre-construction surveys

Pre-construction surveys will be carried out in advance of works where appropriate, including site establishment for temporary compounds, construction areas and pipeline route. This will include, but not limited to:

- Ecological assessments and surveys, including terrestrial, Non-Native Invasive Species and aquatic species. Ecological surveys will be seasonally driven, and the Appointed Contractor will be required to ensure that seasonally dependant surveys are conducted in the right season;
- Ground investigation and soil analysis;
- Archaeological assessments, including intrusive and non-intrusive investigations;
- Water quality monitoring, including levels at Wherrew Intake and upstream and downstream of the HDD crossing of the Brusna River;
- Existing utilities searches; and
- Road and bridge inspection surveys.

Pre-construction surveys are set out in the CEMP (see 1.3.4.1).

### 1.3.2 Working hours

Typical working hours during construction are anticipated to be from 07:00 to 19:00 Monday to Friday and 08:00 to 13:00 on Saturdays, with no work on Sundays or public holidays unless otherwise agreed with the Local Authority or other key stakeholders.

Exceptions may be required for certain construction activities which would need to be undertaken outside typical working hours. This includes trenchless crossing techniques, surface finishing works, abnormal loads, emergency response and avoidance of significant traffic disruption.

Works to be undertaken outside typical working hours will be agreed with the county councils (Mayo and Sligo) in advance and supported by coordination with the Gardaí and Transport Infrastructure Ireland (TII) as required

and communicated to the affected community. The protocol for communication prior to and during the works will be set out in the appropriate Construction Plans (see Section 1.3.4).

## 1.3.3 Personnel

The Proposed Development spans several sites and approx. 30 km of mains laying. The works require a number of discrete work packages. Approx. 126 on-site staff will be present during peak construction periods. These are summarised in Table 1-6.

**Table 1-6 — Anticipated number of workers deployed on site throughout construction phase**

| Work Package | No of workers (per element) |
|---|---|
| Intake works | 20 |
| Pumping station | 15 |
| WTP | 45 |
| New mains | 30 |
| Trenchless methodology | 8 |
| Non-construction (Operational) staff | 8 |
| Total on-site construction staff at peak construction periods | 126 |

It is anticipated that the number of workers on site will fluctuate throughout the programme. During the Operational Phase, it is anticipated that approx. 8 staff will be employed on a regular basis to operate the works.

## 1.3.4 Construction Plans

A number of environmental management plans will be prepared by the Appointed Contractor and implemented prior to the commencement of works and adhered to throughout construction to commissioning. These plans will contain all the required environmental mitigation and monitoring measures, as well as any requirements of the planning permission. These include:

- CEMP;
- Construction Works Traffic Management Plan (CWTMP);
- Stakeholder Communications Plan;
- Public Rights of Way (ProW) Management Strategy;
- CRWMP;
- Tree Protection Plan; and
- Biosecurity Management Plan.

A CEMP, Arboricultural Impact Assessment, CRWMP and Construction Works Preliminary TMP have been submitted with the Application.

### 1.3.4.1 Environmental Management

Environmental Management will be implemented via the CEMP. A CEMP has been submitted with this application, and includes provision for the following:

- Mitigation and monitoring measures and environmental protection, including:
- Ecology surveys and ecological monitoring via an Ecological Clerk of Works (ECoW);
- Environmental monitoring and assessments will be managed by the Site Environmental Manager (SEM). The SEM will be responsible for preparing monitoring reports for submission to Uisce Éireann. The SEM will be responsible for managing complaints from stakeholders.
- Pre-Construction Archaeological monitoring by a licensed Archaeologist;
- Environmental sampling and analysis. UÉ carries out baseline raw water quality analysis at the Wherrew Raw Water Intake. Parameters measured include monthly analysis for alkalinity, pH, turbidity and E.coli. Biannual raw water analysis on the raw water intake from Lough Conn include the list above plus aluminium, chloride, iron, manganese, sulphate, temperature, and total dissolved solids.
- Silt and sediment controls;
- Waste Management;
- Noise and vibration controls;
- Traffic Management;
- Pollution prevention measures and spill response;
- Details of Emergency Plan;
- Details of fuel and chemical storage;
- Details of plant storage and temporary offices;
- Dust control measures;
- Site run-off management;
- Management of HDD operations;
- Management of stockpiles;
- Record keeping;
- Complaints procedures; and
- Training, auditing and reporting.

The CEMP will support development of the project-specific CEMP which will be prepared by the Appointed Contractor, in consultation with the relevant local authorities and submitted for agreement, in advance of commencement of construction and will be fully implemented for the duration of the construction phase to commissioning. The CEMP will set out the Appointed Contractors overall management and administration.

Given the sensitivity of the sites, it is proposed that a Site Environmental Manager (SEM), a Waste Management Coordinator (WMC) as well as a suitably qualified Ecological Clerk of Works (ECoW) will be retained by the Appointed Contractor. The Site Environmental Manager should be suitably qualified to Level 8 National Framework Qualification (NFQ) in subjects related to water, soil, geology, or hydrogeology and waste management. The appointed Environmental Manager will have suitable experience in projects of this type and size. The WMC should be suitability qualified in waste management and have experience in managing wastes from construction sites.

### 1.3.4.2 Traffic Management

The Appointed Contractor will be required to prepare a Construction Traffic Management Plan (CTMP). The plan will maximise workforce safety and the public during the construction of the Proposed Development. A combination of stop/go systems, road closures and diversions will be utilised as agreed with the Local Authority during the installation of the new trunk main. The seasonal nature of traffic patterns will be taken into account, a detailed constraints analysis identifying key complexities in the design as well as a detailed design of each identified crossing or location will be agreed with the local authority in advance of construction. Where there is

potential for access to private lands to be obstructed, works will be coordinated with the relevant landowners in advance of the works.

A Construction Works Preliminary Traffic Management Plan (CWPTMP) will be produced prior to the start of construction and implemented by the Appointed Contractor. This plan will set out key sensitivities (e.g. bridges, culverts, narrow roads), proposed management measures and alternative routes. The details of the Traffic Management Plan will be agreed with the roads departments of the county councils and TII (where measures relate to national roads) in advance of construction activities commencing on site.

#### 1.3.4.3 Stakeholder Communication Plan

A protocol for communication with the Local Authorities, stakeholders and the public will be set out in a Stakeholder Communication Plan, which will be produced in advance of the works by the Appointed Contractor.

#### 1.3.4.4 Tree Protection Plan

The woodland around Belleek contains a number of notable tree specimens, as well as health and safety risks to staff working on the Proposed Development. An Arboricultural Impact Statement has been submitted with this application, which contains arboricultural method statements for the protection of trees and health and safety considerations for workers within the woodland area, to be followed by the Appointed Contractor prior to and during construction works. Provisions will be incorporated into proposed site layout in the form of a Tree Protection Plan in advance of works within Belleek Woods.

#### 1.3.4.5 Resource and Waste Management

The construction of the Proposed Development will be in accordance with the CRWMP produced by the Appointed Contractor in advance of the works, based on updated site information. The CRWMP will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of construction works. A CRWMP has been produced and submitted with this application which has been prepared in accordance with the relevant guidance 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition projects' (EPA, 2022). The document also provides a detailed overview of key waste management considerations for the Proposed Development at this stage, while also allowing for further enhancement as the Proposed Development progresses through to the detailed design and construction stages.

#### 1.3.4.6 Invasive Non-Native Species

A Biosecurity Management Plan (BMP) to control the spread of INNS will be prepared in advance of the works in consultation with the local planning authorities, National Parks and Wildlife (NPWS) and Inland Fisheries Ireland (IFI). This will be prepared in accordance with. S.I. No. 374/2024 - European Union (Invasive Alien Species) Regulations 2024 and S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011 as amended and relevant guidelines.

### 1.3.5 Construction and Operation Vehicles

#### 1.3.5.1 Construction Vehicles

While a range of vehicle types will be used during construction phase, some will be associated with discrete work packages. Construction traffic will typically comprise standard vehicles required for excavation, materials delivery, plant mobilisation, spoil removal and general site servicing. This may include light commercial vehicles, rigid and articulated Heavy Goods Vehicles (HGVs), concrete delivery vehicles, plant transporters and specialist

delivery vehicles. The Appointed Contractor will confirm final vehicle requirements prior to construction. It is anticipated that the number of vehicles on site will fluctuate throughout the programme, however it is anticipated that the bulk of vehicle movements will be over 24 months.

Vehicles anticipated to use public roads would include:

- Cars and other people carriers;
- Light Goods Vehicles (e.g. transit and delivery vans);
- Ordinary Goods Vehicle Type 1 (e.g. rigid vehicles with two or three axles including tractors, box vans, backhoe diggers and trucks which have double rear wheels); and
- Ordinary Goods Vehicle Type 2 such as rigid vehicles with four or more axles, commonly known as a heavy goods vehicle (HGV).

All equipment or vehicles that cannot be driven to site will be transported using a suitable vehicle such as a truck or HGV.

No abnormal loads (i.e. bigger than Ordinary Goods Vehicle Type 2) are currently envisaged. Should an alternative construction methodology require abnormal loads, these will be agreed in advance with the Local Authority and Roads Authority where required.

Construction Traffic Movement is estimated as follows:

- HGV Trips per day = 82 veh/day (or) 246 pcu/day; and
- Staff Trips per day = 148 veh/day (or) 148 pcu/day.

Overall, Construction plus Staff Movement is anticipated to equate to 230 veh/day (or) 394 pcu/day, representing two-way vehicle movements as a worst-case scenario.

#### 1.3.5.2 Operational vehicles

Operational vehicles are anticipated to be predominantly related to staff movements, encompassing 25–50 daily vehicle movements for the entire Proposed Development, with the exception of Lisglennon WTP.

For Lisglennon WTP, it is envisaged that there will be an addition of 2–3 HGV trips per week, typically during off peak hours for maintenance and delivery purposes, including removal of sludge offsite and delivery of chemicals.

The operational phase is expected to generate up to 16 additional two-way vehicle trips per day (approximately 21 PCU/day) at the majority of sites and 4 additional two-way vehicle trips per day (approximately 4 PCU/day) at the Wherrew Intake and RWPS sites. These trips will primarily comprise staff travel, maintenance visits, scheduled deliveries and occasional HGV movements.

Occasional HGV trips are anticipated for operational and maintenance purposes, including sludge removal from Lisglennon WTP and chemical deliveries to Lisglennon and Lough Talt WTP. At the Wherrew Intake and RWPS sites, traffic will be limited to occasional operator and maintenance-related visits.

For assessment purposes, a conservative distribution of daily trips has been assumed as follows for all sites except Wherrew Intake and RWPS:

- **AM Peak:** 6 two-way trips;

- **Off-Peak:** 6 two-way trips; and
- **PM Peak:** 4 two-way trips.

## 1.3.6 Site Compounds and Temporary Working Areas

### 1.3.6.1 General set-up and layout

Indicative Site compound locations and temporary working areas (TWAs) will be required to facilitate the safe movement of vehicles, staff and unloading and offloading equipment, as well as accommodate storage of materials, waste management and welfare facilities. The overall layout of temporary compounds will be set out by the Appointed Contractor and will, as a minimum, comply with the following:

- Access and egress will be through the existing paved access roads off the main road, however where temporary roads are envisaged, these will be detailed in Section 1.2 where appropriate.
- A set down area will be allocated for overnight plant storage and a laydown area for materials. Items including waste management, power generation and storage of materials are incorporated into the temporary design. The location of the site compound set up allows for close monitoring of the works.
- A dedicated area within the compound for refuelling plant or any other equipment that is bunded and has the necessary spill kit equipment available as and when required.
- Dedicated areas for storage of diesel, refuelling area, storage of waste, site office for keeping records will also be included.
- An area for the placement of labelled covered skips for the collection and storage of municipal wastes generated in the canteen, WEEE, timber, plastic, cardboard etc.
- All site compounds and associated TWAs will be included within the Red Line Boundary.

Final compound layouts will be subject to environmental review and comply with the mitigation and constraints outlined in the submitted EIAR and this NIS. It will be a contractual requirement to ensure appropriate spill and pollution prevention and response measures are provided by Contractors, in line with the requirements of the CEMP and the mitigation measures given in the submitted EIAR and this NIS. Used spill kits will be correctly disposed of and replaced. Spill management procedures training will be provided as part of the Site Induction Training.

Sufficient parking will be available on site and the following site storage and temporary welfare facilities comprising of the following non exhaustive list:

- Canteen;
- Serviced Toilet;
- Site office;
- Site storage containers; and,
- A number of waste skip for containing different waste streams e.g. steel, timber, plastics.

The location, size and suitability of the compound(s) will ultimately be at the discretion of the Appointed Contractor once it is located within the project red line boundary and is compliant with the Planning Permission and site access approved by the Local Authority.

The location and layout of the construction compound(s) selected by the contractor will however have to incorporate management and mitigation measures to avoid any potential impacts to environmental receptors. Site access for all personnel and visitors will be strictly controlled and all visitors will report to the site compound prior to entering the construction area.

The Appointed Contractor shall ensure that all compound-related activities are appropriately assessed and managed. This includes implementing site-specific specifications and environmental commitments for the project, with particular attention to avoiding significant adverse effects on the surrounding environment and community. The Appointed Contractor will provide adequate security at these sites.

### 1.3.6.2 Site Compound and Temporary Working Area Locations

Indicative site compounds have been identified at Wherrew RWI&PS (Figure 1-37), Lisglennon RWS&PS (Figure 1-38) and Lisglennon WTP (Figure 1-39), Bonniconlon BPS (Figure 1-40) Windy Gap BPT (Figure 1-41), Lough Talt Reservoir (Figure 1-42) and Bonniconlon Reservoir (Figure 1-43). One further TWA has been identified on the R314 (adjacent to Laughtadawannagh) (Figure 1-44). These will be to support construction at these sites and along the pipeline route, as well as for storage of construction materials along with stockpiling of spoil. TWAs within sites such as Lisglennon WTP will also be utilised as compound areas for equipment and materials storage as well as installation of temporary office and welfare facilities during construction of pipelines.




**Figure 1-37 — Site Compounds and Temporary Working Areas: Wherrew Raw Water Intake & Pumping Station (RWI&PS)**




**Figure 1-38 - Site Compounds and Temporary Working Areas: Lisglennon Raw Water Storage and Pumping Station (RWS&PS)**




**Figure 1-39 - Site Compounds and Temporary Working Areas: Lisglennon Water Treatment Plant (WTP)**




**Figure 1-40 - Site Compounds and Temporary Working Areas. Bonniconlon Booster Pumping Station (BPS)**




**Figure 1-41 - Site Compounds and Temporary Working Areas. Windy Gap Break Pressure Tank (BPT)**




**Figure 1-42 - Site Compounds and Temporary Working Areas. Lough Talt Water Treatment Plant (WTP)**

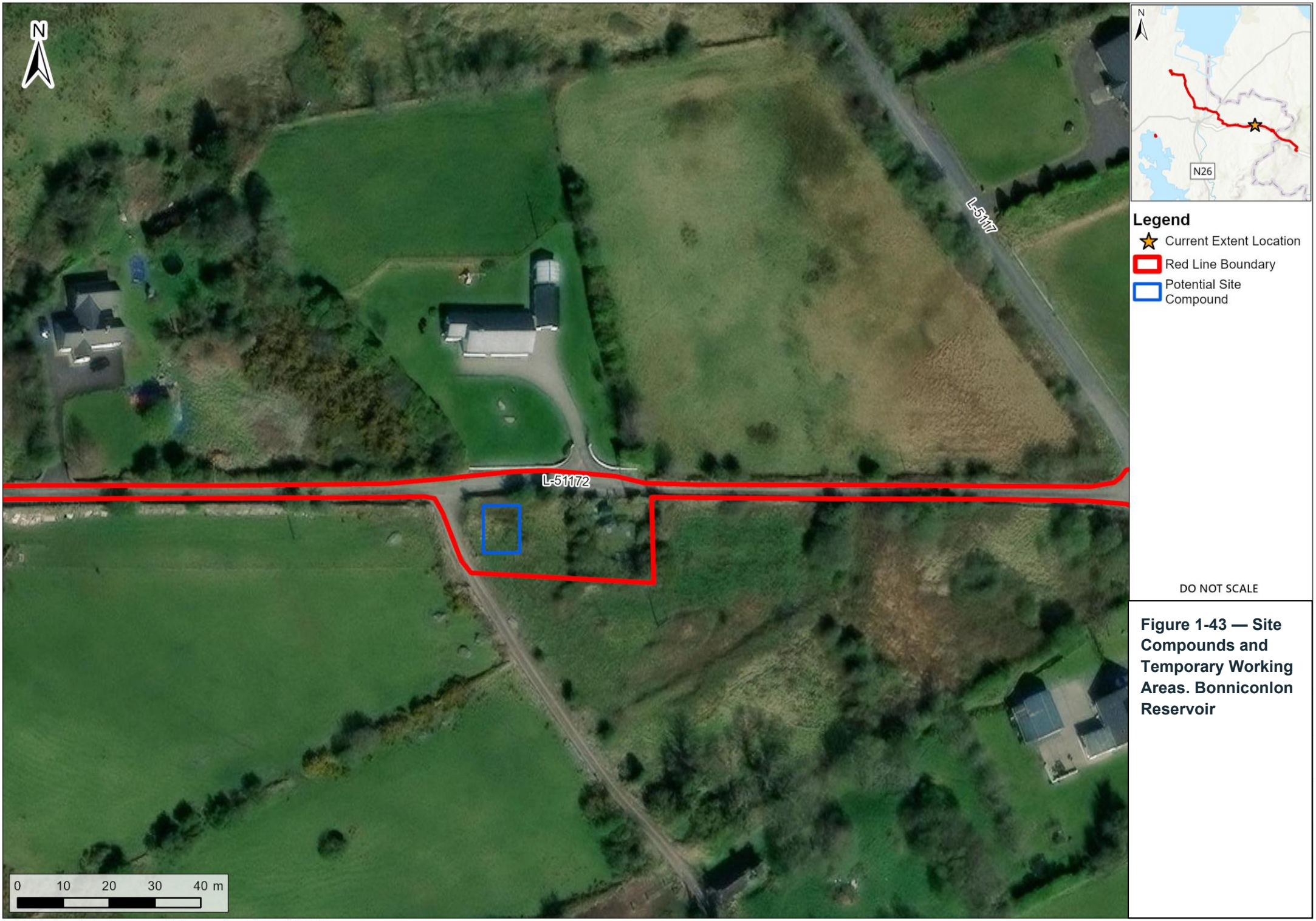



**Figure 1-43 — Site Compounds and Temporary Working Areas. Bonniconlon Reservoir**

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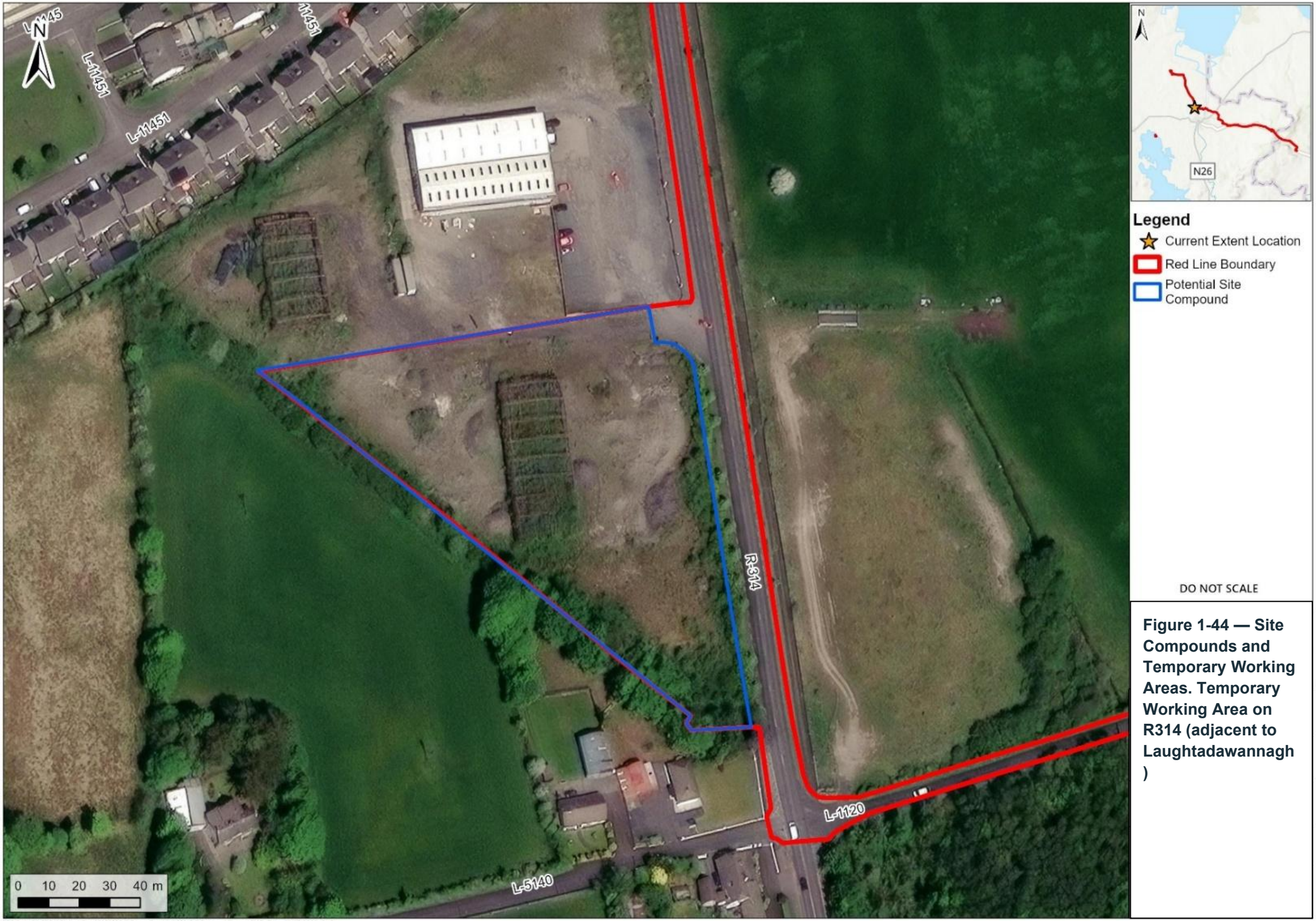



**Figure 1-44 — Site Compounds and Temporary Working Areas. Temporary Working Area on R314 (adjacent to Laughtadawannagh )**

For pipeline installation, the construction working width, i.e. the extent of temporary works area required for installation of a pipeline, will typically be aligned with the agreed wayleave on agricultural land. In general, the temporary working width will be 20 m except where additional space is required and is agreed with the relevant landowner, such as crossings, sections with significant bends or other site-specific constraints, such as features of cultural significance or ecological value requiring site-specific mitigation measures. These have been included in the Red Line Boundary. On roads, appropriate traffic management measures to ensure safety of the workers and road users will be implemented throughout the works, including stop-go systems, road closures and diversions and effective communication in advance. These and other environmental measures will be set out in the CWTMP and other relevant construction management plans (see Section 1.3.4 above). All temporary works will comply with applicable road-safety guidance, and measures will be adapted as required to protect road users, local residents, and the construction workforce. The construction working width in private lands will typically be maximum 10 m. Exceptions which may increase or reduce the working width can be expected where installation can be expected to be complex (e.g. a crossing) or space is constrained (within a built-up area).

Any existing drains within temporary working areas or which intersect with the construction working width will be recorded and temporarily culverted, to be restored as part of site reinstatement.

Physical site security will be provided, including site fencing which will generally be in the form of a 2.4 m boundary fence and manual gates.

Additional lighting will be required for new or extended sites and will be designed with reference to the following Standards:

- Lighting Guide LG06: The Exterior Environment (Chartered Institution of Building Services Engineers 2016);
- 2017 Guide on the Limitation of Effects of Obtrusive Lighting from Outdoor Lighting Installations 2nd Edition (Commission Internationale de l'Eclairage 2017); and
- Bats and Artificial Lighting at Night. Guidance Note 08/23 (Bat Conservation Trust, 2023).

In general, external lighting would be designed to minimise environmental disturbance, including night sky pollution/upward spill, overspill into adjacent properties and disturbance to light-sensitive species (e.g. bats). This could include downward directional lighting and use of accessories such as hoods, cowls, louvres and shields to direct the light is required, as well as use of motion-sensors and short (one minute) timers.

## 1.4 Noise and Vibration

A summary of the main sources of noise is provided in this section.

### 1.4.1 Construction noise

It is anticipated that a temporary increase in noise and vibration can be expected as part of construction activities. The following activities have been identified as comparatively noisy:

- Site Clearance and enabling works;
- Trenching and excavation;
- Pipe laying and specialised crossings;
- Piling and compaction;
- Construction Vibration (e.g. from HDD); and

- Construction traffic.

The Appointed Contractor will be required to comply with "*Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes,* issued by the Transport Infrastructure Ireland (TII) (2014). Standards are set out for construction noise in Table 1-7 and construction vibration in Table 1-8.

**Table 1-7 — Recommended noise thresholds during construction works (from: TII, 2014).**

| Day | Working Hours | Level dB (LAeq,1hr)[1] |
|---|---|---|
| Mon-Fri | 07.00 – 19.00 | 70 |
| Mon-Fri | 19.00 – 22.00 | 60* |
| Saturday | 08.00 – 16.30 | 65 |
| Sundays & Bank Holidays | 08.00 – 16.30 | 60* |

* Construction activity at these times, other than emergency works, will normally require specific permission from the local authority.

**Table 1-8 — Recommended vibration thresholds during construction works (from: TII, 2014).**

| Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of: | | |
|---|---|---|
| **<10Hz** | **10-50 Hz** | **50-100 Hz (and above)** |
| 8mm/s | 12.5 mm/s | 20 mm/s |

A CEMP has been produced (see Section 1.3.4) and includes proposed noise mitigation measures to manage the potential environmental impacts of construction noise. Noise mitigation measures will be site-specific, however the following measures will be considered where appropriate:

- Noise and vibration monitoring will be implemented at all sites to track compliance with the recommended thresholds for construction works;
- Installation of acoustic blankets on fences may be installed if required; and,
- A noise complaints procedure will be set out in the Communications Plan, so that the Appointed Contractor can receive, record, investigate and resolve any concerns as they arise.
- The Appointed Contractor will engage the services of an acoustic consultant to carry out noise monitoring at the nearest noise sensitive location(s) to the construction works. Noise monitoring will be carried out as per the requirements of ISO 1996.

## 1.4.2 Operational noise

Operational noise will be associated with operational plant and equipment and operational traffic. The following operational noise thresholds have been adopted based on Environmental Protection Agency (EPA) NG4: Guidance note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (EPA NG4 noise criteria) for operational noise, and BS 6472-1:2008 (Guide to evaluation of human exposure

[1] These limits are applied at the facades of noise-sensitive locations (NSLs) during construction of the Proposed Development.

to vibration in buildings) for vibration. Stricter noise levels ($L_{AF90}$) will be applied where an area is shown to have low background noise, as shown in Table 1-9. Vibration levels are shown in Table 1-10.

**Table 1-9 — Operational Noise standards (from: EPA NG4)**

| Location | Day-time Noise Criterion, dB LAr,T (07:00 to 19:00 hrs) | Evening Noise Criterion, dB LAr,T (19:00 to 23:00 hrs) | Night-time Noise Criterion, dB LAeq,T (23:00 to 07:00 hrs) |
|---|---|---|---|
| Areas of Low Background Noise | 45 dB | 40 dB | 35 dB |
| All other Areas | 55 dB | 50 dB | 45 dB |

**Table 1-10 — Operational vibration standards for internal assessment (from: BS 6472-1:2008 – Guide to evaluation of human exposure to vibration in buildings)**

| Place and time | Low probability of adverse comment m·s-1.75 | Adverse comment possible m·s-1.75 | Adverse comment probable m·s-1.75 |
|---|---|---|---|
| Residential buildings 16 h day | 0.2 to 0.4 | 0.4 to 0.8 | 0.8 to 1.6 |
| Residential buildings 8 h night | 0.1 to 0.2 | 0.2 to 0.4 | 0.4 to 0.8 |

Noise mitigation measures will be site specific, however the following measures will be considered where appropriate:

- All equipment will be installed in accordance with manufacturer's specifications;
- Where applicable, equipment will be isolated;
- A noise complaints procedure has been established by Uisce Éireann as part of their customer service and is available online for use by the general public (Uisce Éireann, 2021).

# 1.5 Renewable Energy Provision

Improving energy efficiency is a key sustainability measure for improving carbon footprint and reducing greenhouse gas emissions. Renewable energy provision is included to offset electricity consumed in the treatment and pumping of water as part of the Proposed Development.

It is proposed to install solar panels at Lisglennon WTP, Bonniconlon BPS and Lough Talt WTP where feasible to supplement the power requirements of each site. It is intended that electricity generated by these solar panels will be consumed on site and not be exported to the grid.

It is anticipated that panels will be monocrystalline silicon 565 W PV panels (or similar) with tempered glass, with a typical panel size of 1.13 m x 2.28 m. Anticipated key panel data is presented in Table 1-11.

**Table 1-11 — Anticipated key panel data, based on monocrystalline silicon 565 W PV panels**

| Parameter | Dimension |
|---|---|
| Panel Width (m) | 1.133 |
| Panel Length (m) | 2.278 |
| Panel Surface Area ($m^2$) | 2.581 |
| Panel effective Surface Area, Including Walkways & Access Requirements ($m^2$) | 3.7 |
| Annual Mayo utilisable sunlight hours (h) | 965 |

The anticipated installed solar capacity across the Proposed Development is presented in Table 1-12.

**Table 1-12 — Proposed solar capacities across the Proposed Development**

| Description | Unit | Lisglennon WTP | Bonniconlon BPS | Lough Talt WTP |
|---|---|---|---|---|
| Number of Solar panels | No. | 344 | 26 | 14 |
| Area required | $m^2$ | 1271 | 95 | 53 |
| Solar power generated | kW | 194 | 13 | 8 |
| Site power demand | kW | 177 | 320 | 8 |
| % of Site power provided by solar energy | % | 110% | 4% | 100% |
| Annual solar energy generated | kWh | 187,210 | 12,981 | 7,720 |
| Annual site energy demand | kWh | 733,226 | 2,199,490 | 30,386 |
| Max. % of Annual site energy provided by solar energy | % | 11% | 1% | 11% |

Indicative areas which are considered suitable for the installation of solar PV have been included in the proposed layout figures for each site, as follows:

- Lisglennon WTP – Figure 1-17;
- Bonniconlon BPS – Figure 1-22; and
- Lough Talt WTP – Figure 1-31.

# 1.6 Excavated Materials

Cut and fill values are based on ground investigation results undertaken to support development of the overall Proposed Development and are anticipated to be updated following detailed design undertaken by the Appointed Contractor prior to commencement.

## 1.6.1 Cut and fill principles

A circular economy approach will be taken to excavated materials. Any material excavated during the course of construction will be segregated by class (Table 1-13), based on the materials found during the ground investigation works, and re-used within the Proposed Development where possible. For surplus material, emphasis will be on re-use on nearby or anticipated future projects or recycling at appropriate facilities. Material that cannot be re-used or recycled will be sent to an appropriate licensed facility for disposal.

Cut and fill calculations have been undertaken considering the dimensions of the pipe, required bedding and cover as well as interference with land use above (e.g. agricultural versus road).

**Table 1-13 — Classification of excavated material and opportunities for re-use**

| Soil Type | Opportunities |
|---|---|
| General Fill - Granular | Re-use at project site, other projects adjacent in the immediate future |
| General Fill - cohesive | Re-use at project site, other projects adjacent in the immediate future |
| Landscape | Re-use at project site, other projects adjacent in the immediate future |
| Site won - top soil | Re-use at project site, other projects adjacent in the immediate future |
| Crushed Rock | Re-use at project site, other projects adjacent in the immediate future |
| Asphalt | Potential to be sent to Roadstone to be used in the production of asphalt |
| Peat | Re-used as landscaping or restoration |
| Inert material | Potential for re-use |
| Contaminated | To be sent to licenced facility |

## 1.6.2 Quantity Summary

A high-level assessment was carried out to estimate the amount of excavated material that could potentially be re-used as backfill (Table 1-14). Excavated material will be considered suitable where it is found to be clean (i.e. free of contaminants) and of the appropriate classification for the intended use. The assessment was based on Geological Survey Ireland (GSI) quaternary sediments database and took into consideration the different pipe diameters along the trunk main and relevant trench width in accordance with UÉ standards.

Whilst alluvium, blanket peat and cut over raised peat sediments are not considered suitable materials for backfill, peat could be reusable for creating wetland, peatland or for biodiversity. For all other types of sediments, a percentage of re-use was assumed at different depths and types of surface.

As it is envisaged that a significant portion of the excavated material will not be suitable for re-use, various opportunities such as a registration notification as a byproduct for greenfield sites under Article 27 to the Environmental Protection Agency (EPA) will be investigated. End of Waste applications under Article 28 for road planings and waste bitumen and reuse in Reclaimed Asphalt Pavement (RAP) sites will be investigated by the Appointed Contractor. Surplus material, where suitable will be used on site for landfilling or backfilling purposes.

**Table 1-14 — Excavated Material Quantities and estimated quantities for re-use**

| Description of Works | Estimated Total Volume of Excavation ($m^3$) | Estimated Volume of Excavated Material for Re-use / Recovery on site ($m^3$) | Estimated Volume of Excavated Material to be taken off-site for reuse/recovery ($m^3$) |
|---|---|---|---|
| Pipelines | 79,095 | 16,951 | 62,144 |
| Sites | 15,544 | 10,545 | 4,999 |
| Total $m^3$ (%) | 94,639 | 27,496 (29%) | 67,143 (71%) |

### 1.6.3 Management of excavated materials

General measures for the management of excavated materials are provided below. These will be implemented at all sites where applicable.

- Topsoil and subsoil will be stripped and stockpiled separately in designated stockpiles located within the RLB.
- Topsoil and subsoil will not be mixed and will be stored in separate stockpiles positioned within designated areas to facilitate later reinstatement. Stockpiles will be positioned a minimum 20 m from the nearest water course(s).
- Excavated rock will be stockpiled within the Red Line Boundary and removed for offsite disposal to a suitably licensed / permitted waste facility, with the appropriate soil testing carried out. The Appointed Contractor may crush and screen and use for backfill material, if suitable and meets Uisce Éireann's specifications.
- Areas designated for Stockpiling of excavated material will be segregated from construction traffic and kept away from waste that may be l contaminated.
- There is potential for interaction with groundwater to occur during the excavation works. Dewatering and disposal measures will be put in place during excavations.
- Water will be discharged in accordance with the water management measures set out in Section 1.9.
- Grips will be constructed to redirect rainwater and may be filled with drainage stone where applicable.
- A temporary access road area will be excavated, and material will be moved to spoil heaps for further re-use as landscaping at the site.

### 1.6.4 Contaminated land

The proposed pipe will primarily be located along local and private fields and roads in rural / agricultural areas and will pass in the vicinity of a limited number of industrial and commercial premises. Based on the chemical testing results of the Ground Investigation Report and surrounding land use, the risk of discovering unexpected onsite contamination is low, however it may be present in areas that were not investigated. To mitigate the potential of contamination to water transported by the Proposed Development, pipes and fittings resistant to permeation by contaminants will be installed in any areas found to be affected by hydrocarbon contamination.

## 1.7 Biodiversity and Sustainability

Biodiversity protection is a key part of Uisce Éireann's Biodiversity (Uisce Éireann, 2018) and Sustainability (Uisce Éireann, 2021) Policies.

### 1.7.1 Biodiversity

The overall aim of Uisce Éireann's Biodiversity Policy (Uisce Éireann, 2018) is that in association with the provision of water and wastewater services, biodiversity and the natural environment are conserved, protected and where practical enhanced through our responsible stewardship, sustainable water services and strong partnerships. Uisce Éireann launched a Biodiversity Action Plan in 2021, updated in 2025 (Uisce Éireann, 2025) to deliver on this aim.

The Proposed Development will result in the loss of habitats. Habitat loss will predominantly be in areas of hedgerow, grassland, wet grassland, wetland, and woodland. Proposed biodiversity enhancement measures and landscaping design will deliver a net biodiversity gain in line with Uisce Éireann's objectives outlined in their Biodiversity Action Plan, as follows: '*Actively seek opportunities for biodiversity net gain by identifying opportunities for biodiversity enhancement at both existing and proposed Irish Water sites*'.

Habitats across all sections of the project have been mapped, assessed and given a biodiversity score, and through proposed biodiversity enhancement measures and landscaping design, net biodiversity gain will be achieved by providing for the reinstatement and re-establishment of any habitats potentially affected or impacted by the Proposed Development to a level of higher or equal ecological value compared to the pre-construction baseline conditions.

### 1.7.2 Sustainability

The Preliminary Design of the Proposed Development has taken into consideration Uisce Éireann's sustainability ambitions. Uisce Éireann have prepared a Sustainability Framework that faces the challenges of delivering transformative water services that enable communities to thrive. The Framework is founded on four pillars – Environment, Social, Collaboration and Governance, that enables Uisce Éireann take a holistic approach to sustainability in water services:

- Environment: Carbon measurement & reduction, Waste Management, Resource Efficiency – Water/energy, Biodiversity;
- Social: Diversity, Inclusion & Equality, Education, Health, Safety & Wellbeing, Community Infrastructure;
- Collaboration: Circular Economy, Responsible Sourcing/Supply Chain, Research & Innovation; and
- Governance: Creating a culture of sustainability compliance and excellence.

The Uisce Éireann Sustainability Framework has six key sustainability ambitions:

1. Carbon: Net Zero by 2040;
2. Biodiversity: Net Gain across all new projects by 2030;
3. Customer: Achieve Sustainable Economic Levels of Leakage by 2034 in the Water Resource Zones that produce >10,000 $m^3$/day;
4. Employee: Diversity, Inclusion and Equality – achieve inclusion index of 80% by 2030;
5. Community: Educate one million people on the value of water by 2030; and
6. Circular Economy: Ensure circular solutions are considered at each phase in all Uisce Éireann capital projects by 2026.

# 1.8 Site Lighting

An Outdoor Lighting Report was prepared by AtkinsRéalis by using Lighting Reality (2025) design software, and is included in the Strategic Infrastructure Development (SID) Engineering Report (10025936-ATK-ZZ-ZZ-RP-ZZ-253002) submitted with the application.

The Outdoor Lighting Report has been developed in consultation with bat and biodiversity specialists, ecologists and is in line with the guidelines and legislation for the protection of bats with an aim of minimising disruption and disturbance to local bat populations. As included within the report, the 'Guidance Note 08/23; Bats and Artificial Lighting at Night - Institute of Lighting Professionals' (Bat Conservation Trust and Institute of Lighting Professionals, 2023) has been considered with regards to reducing impact on local bat populations.

The design of external lighting for proposed works at all the sites will be carried out with reference to the following Standards:

- Lighting Guide LG06: The Exterior Environment (Chartered Institution of Building Services Engineers 2016);
- 150:2017 Guide on the Limitation of Effects of Obtrusive Lighting from Outdoor Lighting Installations 2nd Edition (Commission Internationale de l'Eclairage 2017);
- Bats and Artificial Lighting at Night. Guidance Note 08/23 (Bat Conservation Trust 2023);
- I.S. EN 13201-2:2015 ROAD LIGHTING - PART 2; and,
- BS 5489-1:2020 Design of road lighting.

The lighting installation would provide for a safe and secure environment for both pedestrians and drivers at the sites and to facilitate operational and maintenance works. The measures adopted are listed below:

- Exterior lighting would be turned off unless operational staff are present on-site;
- Luminaires (light fixtures), light standards (poles) and all other fixtures selected will be sensitive to the surrounding environment;
- The required luminance levels will be achieved by selecting the most appropriate luminaires and lamp sources and carefully implementing the agreed control philosophy for operation of exterior lighting;
- All luminaires used will be without UV/IR elements;
- A warm white spectrum (<2,700 kelvins (K) will be used to reduce the blue light component of the Light Emitting Diode (LED) spectrum; and,
- The positioning of outdoor lighting will be directed away from any adjacent linear habitats (e.g. hedgerows, treelines, rivers, woodland edge) to ensure that there is no light spill onto bat corridors.

For the Proposed Development, following type of external lighting is proposed:

- Approx. 1-1.5 m high bollard with directional propagation characteristic;
- Internal linear luminaire (in kiosks);
- Handrail luminaire;
- Wall mounted luminaire; and,
- Post mounted luminaire (max. post height = 4 m).

# 1.9 Scour Management

Fittings are required to ensure safe operation of the water network and enable appropriate water management and maintenance and will be appropriately marked with indicator plates. These include sluice valves, hydrants, scour valves and washout hydrants, air valves, flow meters, Pressure Reducing Valves (PRVs) and thrust blocks.

Fittings and markers will be installed in accordance with the appropriate Uisce Éireann standards and specifications. Indicative locations have been included in the drawings, however final number and position will be subject to detailed design undertaken by the Appointed Contractor.

Dewatering and controlled scour discharges of raw and treated water are required as part of construction, commissioning and operation and maintenance activities. Raw water will be transferred from Wherrew RW&PS to Lisglennon WTP via Lisglennon RWS&PS. Treated water will be transferred along the treated water transfer mains as well at Lisglennon WTP, Bonniconlon BPS, Bonniconlon Reservoir, Windy Gap BPT and Lough Talt WTP.

For all pipelines, scour valves are located at low points along the route. When carrying out emergency works, a section of the pipeline will need to be isolated and emptied in a controlled manner by opening the dedicated scour valve. Maintenance activities such as scouring will be infrequent and undertaken in a manner that avoids release of chlorinated water to the environment. The incorporation of advanced telemetry and automated control will enable continuous monitoring of flows, pressures and water quality, allowing for rapid response to any potential issues and ensuring the system operates within defined parameters at all times.

For the seven key locations, the scour proposal is listed in Table 1-15.

**Table 1-15 — Proposed Scour Management for Infrastructure Sites**

| Site | Scour required | Discharge Method |
|---|---|---|
| Wherrew RWI&PS | Yes | Minimal volumes expected at flowmeter chamber and associated pipework. Untreated water, released back through the intake. |
| Lisglennon RWS&PS | Yes | Minimal volumes expected at flowmeter chamber and associated pipework. Raw water, discharge into nearby watercourse. |
| Lisglennon WTP | Yes | All process tanks on site can be drained into a dedicated drain down tank with a large holding capacity. This drain down tank can then be gradually emptied to the used washwater equalisation tanks which in turn will be recirculated to the head of the works after settlement. |
| Bonniconlon BPS | No | No scour anticipated as there is no storage at site. |
| Bonniconlon Reservoir | Yes | Both the reservoirs will be isolated and allow to drain down by gravity into the network. The remainder of the water at the bottom of the tanks will be collected via the scour point and Bauer connection, dechlorinated and tankered away. |
| Windy Gap BPT | Yes | There is a dedicated scour line and a scour extraction point fitted with a Bauer connection. The tank will be isolated and allowed to drain down by gravity into the network. The remainder of the |

| Site | Scour required | Discharge Method |
|---|---|---|
| | | treated water will be collected via the scour point and Bauer connection, dechlorinated and tankered away. |
| Lough Talt WTP | Yes | The new reservoir will be isolated and allowed to drain down into the network by gravity. The remainder of the water will be collected via the scour point and Bauer connection, dechlorinated and tankered away. The repurposed reservoir does not have an existing scour line. A new scour point will be cored at the base of the tank to allow a Bauer connection, which will be then collected, dechlorinated and tankered away. |

Treated waters required to be discharged will be dechlorinated. All discharge methods are subject to detailed risk assessment and agreement from relevant stakeholders. All anticipated discharge locations will be assessed in advance of any discharge with regard to the sensitivity of the receiving environment and capacity to accept treated water without resulting in negative effects on sensitive receptors, such as protected sites, aquatic species and hydromorphology, as well as impacts on local stakeholders and agricultural land.

Agreement will be sought with relevant stakeholders (such as landowners or the local authority) in advance as appropriate. Where it is concluded that dechlorinated/treated water should not be discharged into the environment, water will be collected and tankered to an appropriate disposal location, where allowed.

## 1.10 Decommissioning

The Proposed Development will deliver regionally important strategic infrastructure. The target year design of new or upgraded elements is up to 50 years, however, considering that the Proposed Development will be essential for continued safe and secure water supply for the population of Mayo and Sligo, there is no plan to decommission these structures, and Uisce Éireann is committed to maintaining and repairing them into the future.

# 1.11 Programme

A Preliminary Programme is shown in Table 1-16 to give high level timelines. Total project duration (including design, development and review as well as pipeline final road reinstatement) is anticipated to be 35 months.

**Table 1-16 – Preliminary programme for the Proposed Development**

| Element | Y1 2027 | | | | Y2 2028 | | | | Y3 2029 | | | | Y4 2030 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| Design, development and review | | | | | | | | | | | | | | |
| Construction | | | | | | | | | | | | | | |
| Cessation of abstraction at Lough Talt | | | | | | | | | | | | | | |
| Pipeline Final Road Reinstatement | | | | | | | | | | | | | | |

## 1.11.1 Road Construction Schedule

Preliminary discussions were held with both Mayo and Sligo County Councils regarding the specific requirements for road reinstatement post construction works. Both entities agreed that the road reinstatement will be carried out as per the Guidelines for Managing Opening in Public Roads, Revision 1, April 2017. Further discussions will be held with the Local Roads Authorities once a T2 Road Opening Application is submitted for the Main Works.

# 2. Scope of Study

## 2.1 Legislative Context

### 2.1.1 Natura 2000

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

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

### 2.1.2 Appropriate Assessment

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

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

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

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

In addition to the effects of the plan or project on its own, the combined effects arising from the plan or project under consideration and other plans and projects must also be assessed.

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

The "*precautionary principle*" applies to all of the legal tests in AA, i.e., in the absence of objective information to demonstrate otherwise, the worst-case scenario is assumed. Where the tests established by Article 6(3) cannot be satisfied, Article 6(4) applies (see explanation in Section 2.2 below).

### 2.1.3 Competent Authority

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

## 2.2 Appropriate Assessment Process

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

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

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

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

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

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

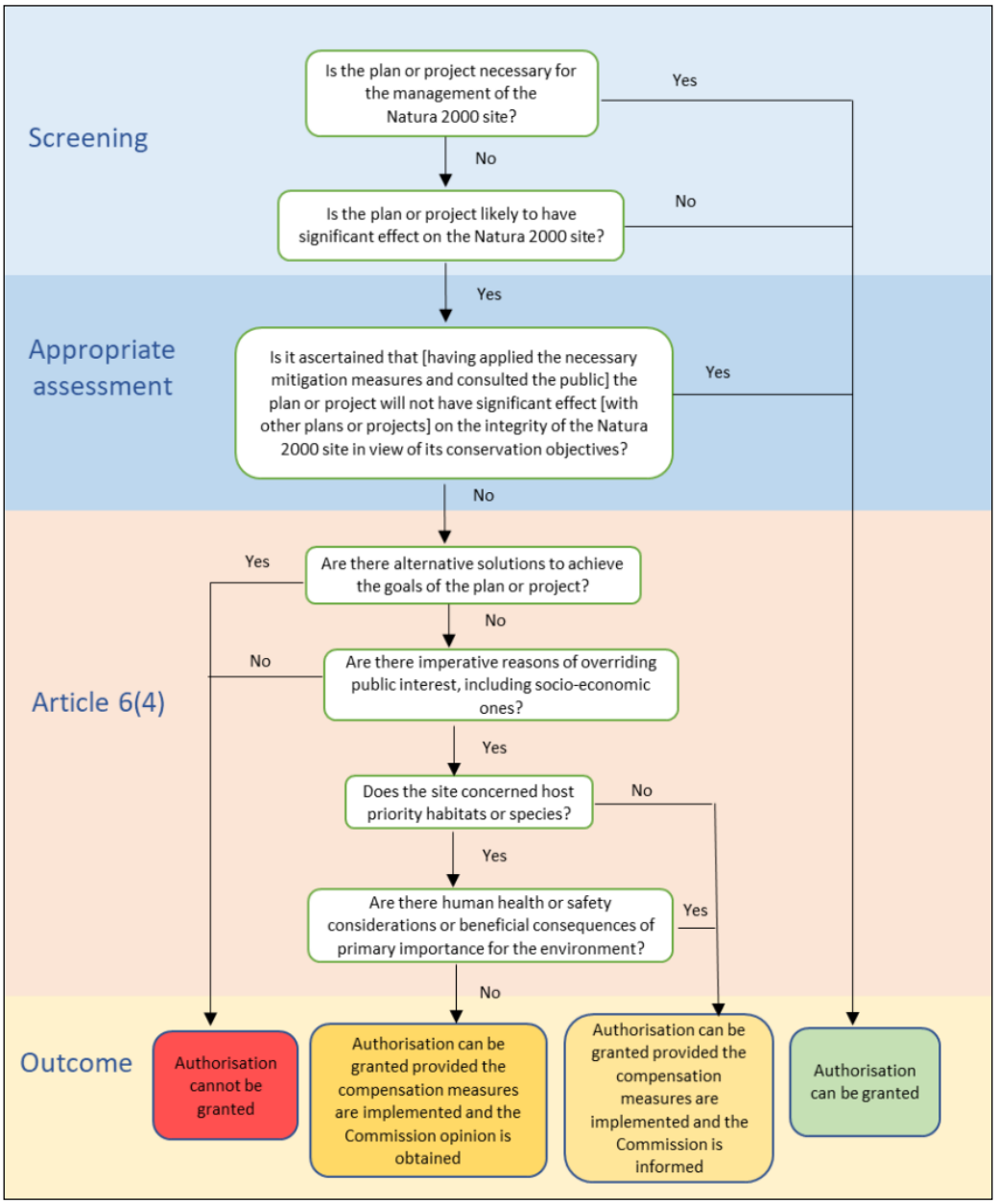



**Figure 2-1 – Stages of the Appropriate Assessment process (EC, 2021a)**

# 3. Methods

## 3.1 Guidance documents

The Screening for Appropriate Assessment and Natura Impact Statement was prepared with reference and due consideration to the following documents, guidelines and case law, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. *Official Journal of the European Communities* L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. *Official Journal of the European Union* L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. *S.I. No. 77/2011* (as amended) ("the Habitats Regulations").
- Planning and Development Act, 2000. *No. 30 of 2000* (as amended) ("the Planning and Development Acts").
- Planning and Development Regulations, 2001. S.I. No. 600/2001 (as amended) ("the Planning Regulations").
- EC (2019). *Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC.* European Commission, Brussels. *Official Journal of the European Union* C 33/1-62.
- EC (2021a). *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, Brussels. *Official Journal of the European Union* C 437/1-107.
- EC (2021b) *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive. C(2021) 7301.* European Commission, Brussels.
- DG Env (2022) *Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary.* Directorate-General for Environment, European Commission, Brussels. Publications Office of the European Union, Luxemburg.
- DEHLG (2010a) *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Revised 11/02/2010.* Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b) *Circular NPW 1/10 & PSSP 2/10. Dated 11/03/2010.* Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2012) *Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document. April 2012.* National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2021) Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. *National Parks & Wildlife Service Guidance Series* 1, Department of Housing, Local Government and Heritage, Dublin.
- Mullen, E., Marnell, F. and Nelson, B. (2021) Strict Protection of Animal Species – Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority. *National Parks & Wildlife Service Guidance Series* 2, Department of Housing, Local Government and Heritage, Dublin.
- OPR (2021) *Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.* Office of the Planning Regulator, Dublin.
- Case law, including *Waddenzee* (C-127/02), *Sweetman v. An Bord Pleanála* (C-258/11), *Kelly v. An Bord Pleanála* (IEHC 400), *Commission v. Germany* (C-142/16), *People Over Wind* (C-323/17), *Holohan v. An Bord Pleanála* (C-461/17), *Eoin Kelly v. An Bord Pleanála* (IEHC 84), *Heather Hill* (IEHC 450) and *Eco Advocacy v. An Bord Pleanála* (C-721/21).
- Sundseth, K. and Roth, P. (2014) *Article 6 of the Habitats Directive – Rulings of the European Court of Justice.* Ecosystems LTD (N2K Group), Brussels.

## 3.2 Desk Study

Baseline data regarding the receiving environment, including Natura 2000 sites, was gathered through a thorough desk study.

The boundaries of Natura 2000 sites were downloaded from *NPWS: Maps and Data* <https://www.npws.ie/maps-and-data>. Information on sites, including their overall structures and functions, qualifying interests, conservation objectives and threats/pressures and activities therein, was found in the Site Synopsis, Natura 2000 Standard Data Form, Conservation Objectives and supporting documents for each site. Spatial data for site-specific conservation objectives of Natura 2000 sites, and boundary data for other designated sites, such as Natural Heritage Areas, was also retrieved from *NPWS: Maps and Data.* Reporting under Article 17 of the Habitats Directive (NPWS, 2019a-c; *Article 17 web tool*) and Article 12 of the Birds Directive (NPWS, 2024c; *Article 12 web tool*) provided further information on the habitats and species concerned at the national level.

Information relating to recent and historical records of species was obtained from the National Biodiversity Data Centre (NBDC) *Biodiversity Maps* <https://maps.biodiversityireland.ie/Map>.

The Environmental Protection Agency (EPA) map viewer *EPA Maps (Water)* <https://gis.epa.ie/EPAMaps/ Water> and spatial data for river, lake, canal, transitional and coastal waterbodies downloaded from the *EPA Geoportal* <https://gis.epa.ie/GetData/Download> was used to identify any hydrological connection between the proposed works and Natura 2000 sites or connected features. Satellite and aerial imagery from Google Earth, Bing Maps and Tailte Éireann was reviewed to identify hedgerows, treelines and other potential ecological features.

In order to inform the assessment of potential in-combination effects, planning applications from the surrounding area were reviewed using the National Planning Application Database, An Coimisiún Pleanála's online map viewer and the EIA Portal.

Information from the aforementioned data sources was last accessed on 13 May 2026.

## 3.3 Site Visit

Ecological Surveys included the lands within the red line boundary of the Proposed Development and lands within a 50m buffer of the Proposed Development. Surveys were undertaken by AtkinsRéalis Ecologists Kevin McCaffrey, Colin Wilson and Daniel Blake between July 2024 and October 2025.

While on site, semi-natural habitats present were recorded using the Fossitt (2000) classification system, in conjunction with the Irish Vegetation Classification and the EU interpretation manual, and their constituent species noted. Potential sensitive ecological receptors present within the survey area were recorded, including the presence of protected species and habitats or habitats that would support protected species, in addition to noting connectivity to European sites. Any presence of non native invasive species was also recorded.

The objectives of the ecological site visits were to: -

- Check for evidence of rare or protected habitats and species and to assess the potential for protected species to be present within the Proposed Development site including bird species listed on Annex I of the EU Birds Directive and habitats suitable to support said species;

- Assess the potential for habitats listed on Annex I of the EU Habitats Directive, as well as species listed on Annex II and IV of the EU Habitats Directive to occur within the Proposed Development site;

- Identify the predominant habitats within the Proposed Development site, with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000); and

- Check for evidence of invasive plant species as listed on the 3rd Schedule of the EC Birds and Natural Habitats Regulations (S.I. 477 of 2011, as amended).

Site surveys included for any evidence of mammal activity (e.g. badgers, otters) within the Proposed Development site or within 50m of the Proposed Development site.

Trees and structures within the Proposed Development site were also visually assessed for signs of bat activity and potential bat roost features. Site specific bat activity surveys were carried out within Belleek Woods, the only woodland habitat within the Proposed Development site.

During the site visits, invasive species noted while on site were also recorded. Incidental sightings of any birds, mammals, invertebrates, and amphibians were noted during site visits to further evaluate the importance of the Proposed Development site to flora and fauna (in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017).

Ecological survey methods were in accordance with those outlined in the following documents: -

- A Guide to Habitats in Ireland (Fossitt, 2000);

- Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.,* 2011);

- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA,2009);

- *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* CIEEM (2024, Version 1.3);

- Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017);

- NRA (2006) Guidelines for the treatment of Badgers prior to the construction of national road schemes;

- NRA (2009) Guidelines for the treatment of Otters prior to the construction of national road schemes;

- Bat Survey for Professional Ecologists; Good Practice Guidelines 4th Edition.

## 3.4 Statement of Authority

The Screening for Appropriate Assessment report was prepared by Kevin Coogan, Niamh Kelly, Daniel Blake and Colin Wilson. Kevin McCaffrey provided peer review and support.

**Kevin Coogan** (AtkinsRéalis) has a BSc (Hons) in Zoology from University College Dublin. He has developed ecological surveying skills through country-wide small river sampling experience, as well as habitat evaluation experience in Spain and Ireland. He has volunteer experience in bird surveying on North Bull Island SPA and Ireland's Eye SPA. Kevin collated background information for this assessment. He conducts research and site surveys including habitat classification (Fossitt classification), bird surveys, and terrestrial mammal activity. He assists in bat surveying and has carried out numerous bat emergence/activity surveys. He also assists in the development of Appropriate Assessment Screening reports, biodiversity chapters in various types of environmental assessment report (environmental constraints reports, feasibility reports, project design reports). Kevin undertook field surveys and for the proposed development assisted with the collation of background information to inform this report.

**Daniel Blake** (AtkinsRealis Dublin) has a degree in Wildlife Biology and has been working in the environmental consultancy sector since 2017. He has worked in both large scale government infrastructure projects as well as domestic projects across the UK and Ireland conducting both environmental and ecological roles. Primarily conducting protected species surveys such as bats, badgers, birds, reptiles, small mammals and amphibians as well as invasive species surveys. He has also earned a Natural England licence for the survey of Great crested newt. He has been involved in habitat surveying and assisted in the writing of Appropriate Assessments, Preliminary ecological appraisals and protected species reports. Throughout his career he has acted as an ECoW for numerous sites to ensure environmental laws and practices are met. He has been involved in water and soil sampling surveys, levelling surveys and creation of hibernaculum. Daniel undertook field surveys and for the proposed development assisted with the collation of background information to inform this report.

**Niamh Kelly** (AtkinsRéalis) holds a BSc (Hons) in Environmental Science with Ecology from Atlantic Technological University Sligo. She has experience in ecological surveying through aquatic and terrestrial fieldwork and vegetation identification with Teagasc. She has volunteered as a warden for the Little Tern colony at Baltray and contributed to the All Ireland Daubenton's Bat Waterways Survey. Niamh collated background information for this assessment. She supports the preparation of AA Screening Reports, NIS, Environmental Impact Assessment (Biodiversity Chapters), Constraints Assessments, Feasibility Reports and MCAs. Niamh conducts research, site surveys, habitat classification (Fossitt), terrestrial mammal activity and assisting with bat emergence and activity surveys.

**Colin Wilson** (Atkins Dublin) has a BSc (Hons) in Environmental Science and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has over 19 years working in the fields of ecology and environmental management. He is a Senior Ecologist with experience in ecological surveying, environmental assessment, on-site ecological supervision and mitigation. He has experience on multiple infrastructure projects regarding all elements of surface and groundwater management, monitoring, sampling and associated reporting. Colin also has a broad range of experience in invasive species management, biosecurity and control. Colin has prepared AA screening reports, Natura Impact Statements and has also been involved in the development of Environmental Operating Plans and Construction Environmental Management Plans for a number of national infrastructure projects. Colin undertook field surveys and is the author of this report.

**Kevin Mc Caffrey** (Atkins Galway) has a BSc (Hons) in Applied Freshwater and Marine Biology and a MSc in Environmental Sustainability. He is a Senior Ecologist with over 13 years' experience in freshwater and marine ecology, environmental surveying, impact assessment and as an Ecological clerk of Works. He has prepared and reviewed a wide range of technical reports including Environmental Impact Assessment, AA screening, Natura Impact Assessment and sanitary surveys. Kevin undertook site surveys and provided peer review and support for this assessment.

# 4. Existing Environment

## 4.1 General Overview

The Proposed Development is located within a rural setting. Water abstraction is proposed from Wherrew Raw Water Intake and Pumping Station (RWI&PS) site from where it is pumped to Lisglennon WTP for treatment. From Lisglennon the route of the proposed new trunk main / pipeline follows the existing road network for the majority of its length. In the western section, the pipeline passes close to several rural residential properties before connecting to an existing pipeline under the River Moy Estuary north of Ballina. The crossing of the estuary via this existing pipeline is noted to be outside of the Proposed Development boundary. On the east side of the estuary, the proposed new trunk main is aligned in a generally southeast direction along the road network, progressing into the Ox Mountains toward the Lough Talt WTP.

Approximately 85% of the pipeline; 25.7 km of the total 30.2 km, will be installed within the existing road corridor. The remaining sections will require offroad construction through greenfield areas, including agricultural lands and Belleek Woods.

Treated water will gravitate from the Lisglennon WTP toward Ballina and subsequently onward to Bonniconlon village. Beyond this area, changes in local topography necessitate pumping. A new booster pumping station is proposed near Bonniconlon, from which treated water will be pumped via a rising main to a break pressure tank at Windy Gap, Knocknasliggaun, in the Ox Mountains. From Windy Gap, water will flow to the existing Lough Talt WTP site, which will be repurposed to house the new treated water storage tank and treatment facilities, before entering the existing Lough Talt RWSS network under gravity.

## 4.2 Designated Conservation Areas

### 4.2.1 Internationally Designated Sites – European Sites

European sites within and surrounding County Mayo and County Sligo were assessed to determine whether any potential pathways or linkages exist between the Proposed Development and the European sites. The assessment considered European sites that lie wholly or partly within the Proposed Development area, as well as those that may be connected through hydrological or groundwater linkages, ecological corridors, or potential disturbance pathways.

Section 5.1 below defines the Source-Pathway-Receptor model used for the Proposed Development in more detail and assesses all European sites within and around the Proposed Development site and determines whether there is potential connectivity with the proposed scheme or not, the findings of which are summarised below.

The following twelve European sites in Counties Mayo and Sligo were subject to assessment to determine if there is any connection or pathway from the Proposed Development;

- SACs: River Moy SAC (002298), Killala Bay/Moy Estuary SAC (000458), Lough Hoe Bog SAC (000633), Lough Nabrickkeagh Bog SAC (000634), Ox Mountains Bog SAC (002006), Lacken Saltmarsh and Kilcummin Head SAC (000516), Bellacorick Bog Complex SAC (001922), Glenamoy Bog Complex SAC (000500), Turloughmore (Sligo) SAC (000637) and Newport River SAC (002144).
- SPAs: Lough Conn and Lough Cullin SPA (004228) and Killala Bay/Moy Estuary SPA (004036).

The following 5 no. European Sites have direct or indirect connectivity to the Proposed Development;

- River Moy SAC

- Killala Bay/Moy Estuary SAC
- Lough Hoe Bog SAC
- Lough Conn and Lough Cullin SPA
- Killala Bay/Moy Estuary SPA

The following sections describe the connectivity between the identified European sites and the Proposed Development, and also presented is site survey evidence for any European sites located wholly or partly within the Proposed Development footprint.

#### 4.2.1.1 River Moy SAC / Lough Conn and Lough Cullin SPA

**Lough Conn**

The Proposed Development is located within the River Moy SAC and Lough Conn and Lough Cullin SPA at the existing Wherrew RWI&PS site at Lough Conn. The works will involve installing new raw water abstraction infrastructure, including a new intake pipe and a fish return system. The revised intake design also includes infilling the existing intake channel to restore the natural shoreline of the lough. Figure 4-1 below illustrates the Proposed Development's direct interaction with Lough Conn, which lies within and forms part of the River Moy SAC.

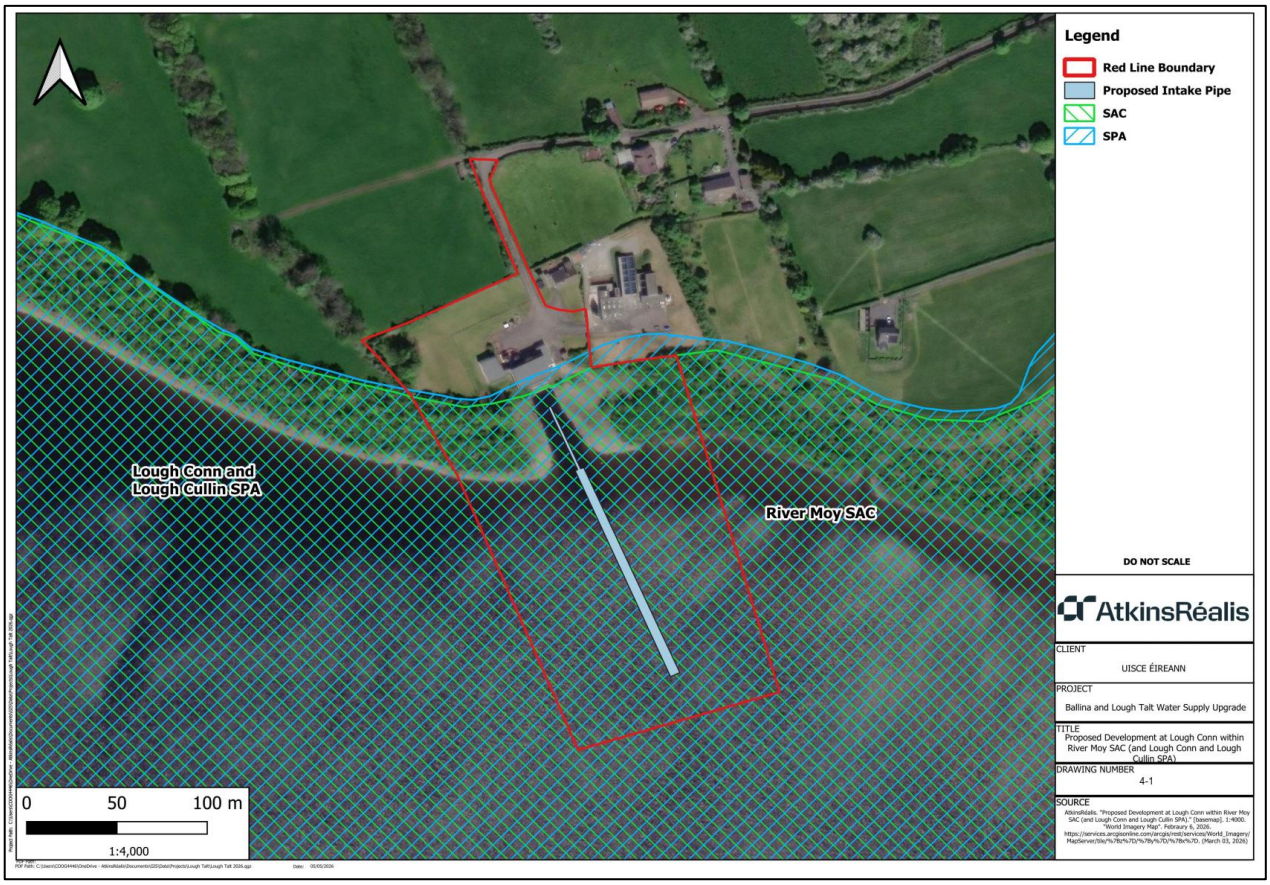



**Figure 4-1 – Proposed Development at Lough Conn within River Moy SAC and Lough Conn and Lough Cullin SPA**

**Site Survey Evidence – Wherrew Raw Water Intake and Pumping Station at Lough Conn**

The ground surrounding the abstraction building to the north is amenity grassland (GA2), with one large ash tree to the west (potential signs of ash die back). The western side of this area is bordered by native hedgerow (WL1)

containing hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*) and bramble (*Rubus fruticosus*). The grounds surrounding the treatment plant are best characterised as wet grassland/amenity grassland (GS4/GA2) as the area does not appear to be cut as frequently as other areas. Species present within the grassland include vetch (*Vicia*), soft rush (*Juncus effusus*), ribwort plantain (*Plantago lanceolata*), silverweed (*Potentilla anserina*), creeping buttercup (*Ranunculus repens*), stitchwort (*Stellaria holostea*) and dock (*Rumex* species). The boundary fence has been overgrown by a number of species including hazel (*Corylus avellana*), sycamore (*Acer pseudoplatanus*), willow (*Salix* species), hogweed (*Heracleum sphondylium*), bramble, vetch, ivy (*Hedera*), and great willow herb (*Epilobium hirsutum*) and is best characterised as hedgerow (WL1). Bird species recoded during the site visit include great tit (*Parus major*), swallow (*Hirundo rustica*), wood pigeon (*Columba palumbus*) and goldfinch (*Carduelis carduelis*).

A deep channel has been dredged from the lake shore to the current abstraction point. Along either side of the channel and following along the shoreline, is a band of lose calcareous rock which becomes mostly covered when the lake rises in winter. Species of plant present within the loose rock include; birdsfoot trefoil (*Lotus corniculatus*), selfheal (*Prunella vulgaris*), common sedge (*Carex nigra*), creeping buttercup and woundwort (*Stachys sylvatica*). Dead zebra mussel (*Dreissena polymorpha*) shells were present along the shoreline with live mussels visible below water level, zebra mussel is not to be an invasive species. The rocky lake shoreline is backed by stunted transitional woodland comprising alder (*Alnus glutinosa*) and willow.

**Brusna River Crossing**

The Proposed Development further interacts directly with the River Moy SAC where the pipeline route crosses the Glenree / Brusna River (hereafter referred to as the Brusna River). The pipeline is aligned through agricultural grassland fields either side of the river crossing and will utilise Horizontal Directional Drilling (HDD) under the Brusna River. HDD launch / reception pits will be set back a minimum of 20 m from the Brusna River banks within the SAC. Figure 4-2 below illustrates the Proposed Development's crossing of the Brusna River, which lies within and forms part of the River Moy SAC.

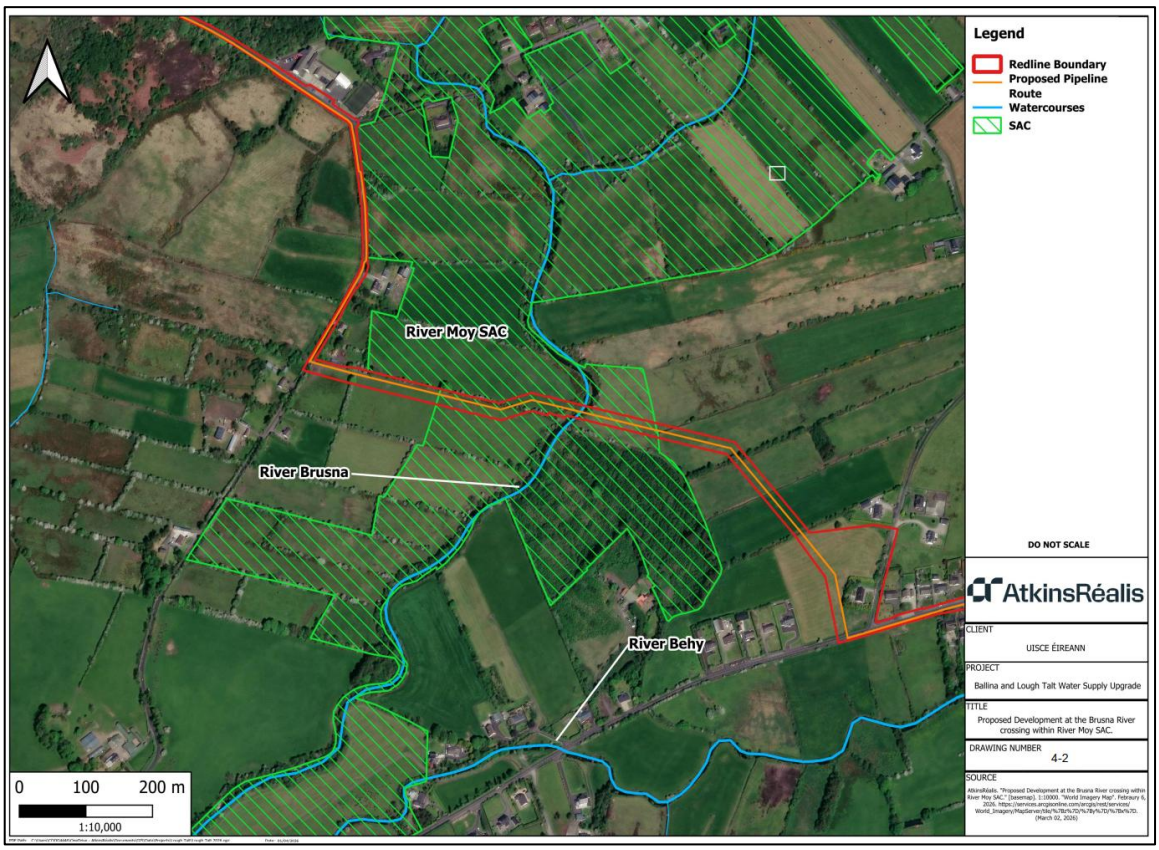



**Figure 4-2 – Proposed Development at the Brusna River crossing within River Moy SAC**

**Site Survey Evidence – Brusna River Crossing**

The pipeline runs off road for approx. 980 m between Behy Road and the R294. Along this section, the route passes through improved agricultural grassland (GA1), bordered by mature hedgerows (WL1) and treelines (WL2) comprised of hawthorn, ash and sycamore. On the eastern side of the River Brusna, a conifer plantation (WD4) is present but is intentionally avoided by the pipeline alignment.

West of the River Brusna crossing, the pipeline is aligned through approx. 400 m of agricultural grassland, with 1 no. section of hawthorn hedgerow approx. 5 m wide requiring removal to facilitate construction. The proposed pipeline will not interact with any hedgerows, trees, or riparian habitats along the banks of the River Brusna.

On the eastern side of the River Brusna crossing, before the pipeline connects with the R294, the alignment extends through approx. 580 m of agricultural grassland. In this area, the pipeline intersects one hawthorn dominated hedgerow and one treeline comprised of hawthorn and ash. Approximately 5 m of each feature is proposed to be removed to accommodate the works.

The riparian habitat at the pipeline crossing location is mostly grassy banks with a willow treeline on the southern bank and a small alder and one large ash on the north bank. Montbretia was noted growing along the upstream northern bank. Set bank from the northern bank there are old spoil piles presumably from historic dredging activities. Scrub habitat near the river bank contains brambles, gorse, willow along with a variety of grass species. Downstream the riparian habitat is much denser with scrub immediately next to the river backed by a treeline on both banks. The treeline becomes more continuous and established the further downstream from the pipeline crossing point. The treeline contains ash, alder, willow, sycamore and hawthorn. No qualifying interest habitats of River Moy SAC (e.g. alluvial woodlands, oak woodland, hay meadows) are present at the pipeline crossing point nor within the field systems either side of the River Brusna that are within the River Moy SAC.

#### 4.2.1.2 Killala Bay/Moy Estuary SAC and SPA

The proposed pipeline route will cross beneath the River Moy Estuary at the northern end of Ballina town. This section of the estuary lies within Killala Bay / Moy Estuary SAC and Killala Bay / Moy Estuary SPA. The Proposed Development will make use of an existing trunk main located under the estuary to facilitate the transfer of water to a proposed new trunk mains located to the east of the estuary. Figure 4-3 below illustrates the location of the crossing of Killala Bay / Moy Estuary SAC and SPA.

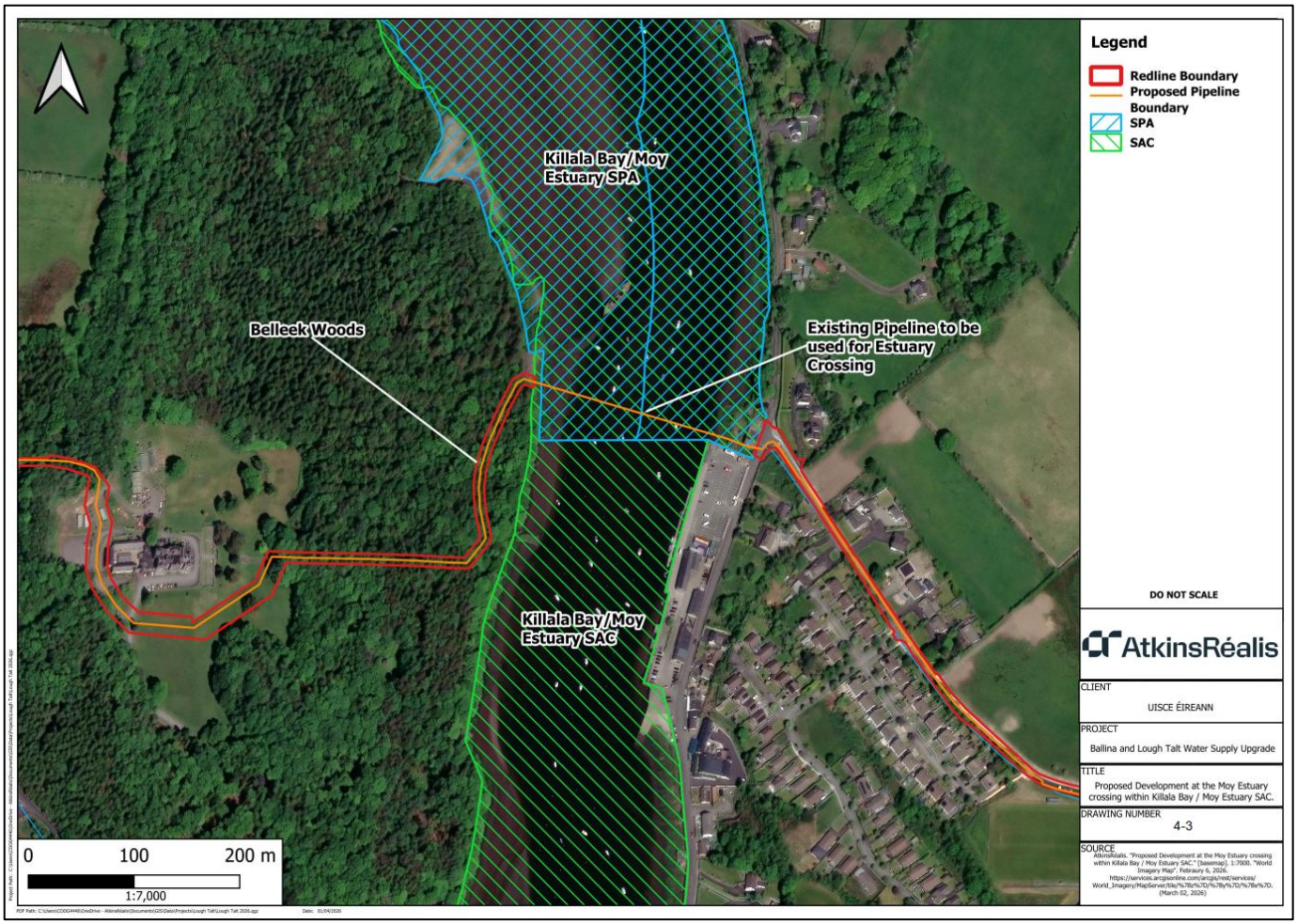



**Figure 4-3 – Proposed Development at the Moy Estuary crossing within Killala Bay/Moy Estuary SAC/SPA**

### 4.2.1.3 Lough Hoe Bog SAC

The proposed pipeline route runs alongside Lough Hoe Bog SAC for approx. 4 km as it crosses the Ox Mountains. This section largely follows the existing roadway, apart from a short off-road section. It represents the final stretch of the pipeline before connection to the Lough Talt WTP, which will be repurposed to accommodate the new treated water storage tank and treatment facilities. The pipeline enters the SAC for the approx. 20 m at Lough Talt to facilitate a small Unnamed Stream crossing, the remainder of the route in this area follows the R294. Figure 4-4 illustrates the alignment in relation to Lough Hoe Bog SAC.

Along the R294, the pipeline runs directly beside Lough Talt, part of Lough Hoe Bog SAC, for approx. 2 km. Within this stretch, it will cross the Unnamed Stream and seven drainage ditches that discharge to the lake. Two of these crossings, the Unnamed Stream and one ditch, occur off road, while the remaining crossings take place within the road corridor, where the pipeline will be installed beneath existing culverts. These culverted crossings will not involve any interaction with open channels or riparian habitats.

**Site Survey Evidence – Watercourse Crossings**

At the off-road unnamed stream crossing, the channel resembles a field drain with no visible flow and is heavily vegetated. On the northern side of the channel, the surrounding habitat is comprised of regularly maintained amenity grassland (GA2) which provides access to the lake for launching fishing boats. Several trees, including ash and conifer species, occur along the channel margins, and Fuchsia is also present. One semi mature ash may be removed to

facilitate the works. The southern side of the channel supports scrub (WS1) dominated by bramble and nettles, with common willowherb throughout. Due to dense vegetation and negligible flow, the stream could not be surveyed for macroinvertebrates and was noted to contain scattered litter. This unnamed stream will be crossed using trenchless techniques (pipe jacking). No suitable habitats for Geyer's Whorl Snail occur at or within 100 m of the crossing location. Figure 4-5 shows the location of the unnamed stream at Lough Talt. No wetland habitats suitable for supporting Geyer's Whorl (*Vertigo geyeri*) snail species are located at this crossing point. The location of the nearest optimal *V. geyeri* habitat is on a headland approx. 130 m south of the proposed stream crossing point (Figure 4-5).

A second short off-road section occurs approx. 500 m before the pipeline terminates at the Lough Talt WTP. Here, the alignment deviates from the R294 for approx. 2 0m to cross a small field drain on the northern side of the road, outside the SAC boundary. The habitat at this location is wet grassland (GS4), dominated by soft rush with patches of bracken, and foxglove (*Digitalis purpurea*) also recorded. The drain has no fisheries value and could not be sampled for macroinvertebrates due to its small size and the presence of a willow tree growing in the middle of the drain and adjoining road culvert arch.

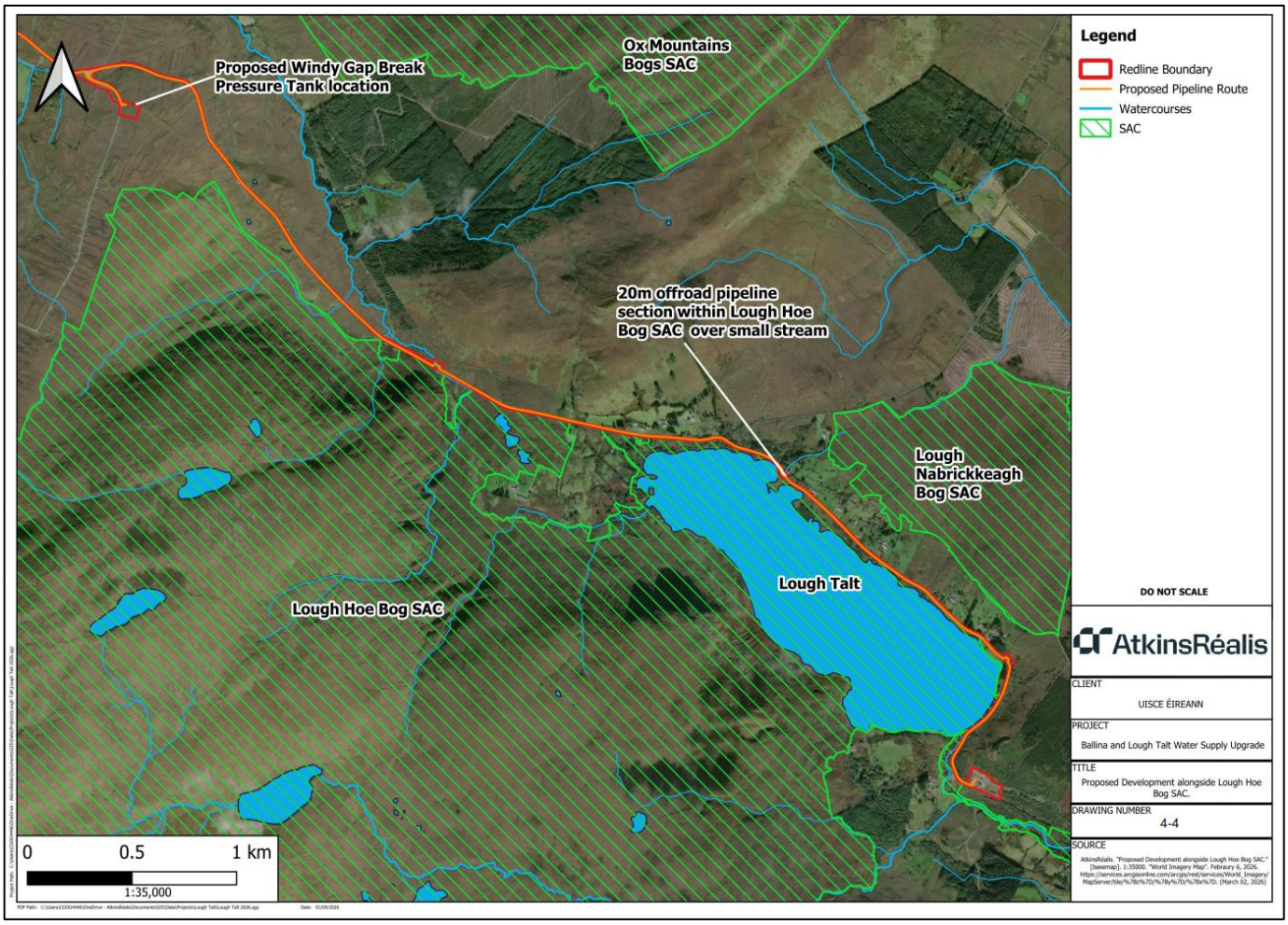



**Figure 4-4 – Proposed Development alongside Lough Hoe Bog SAC**

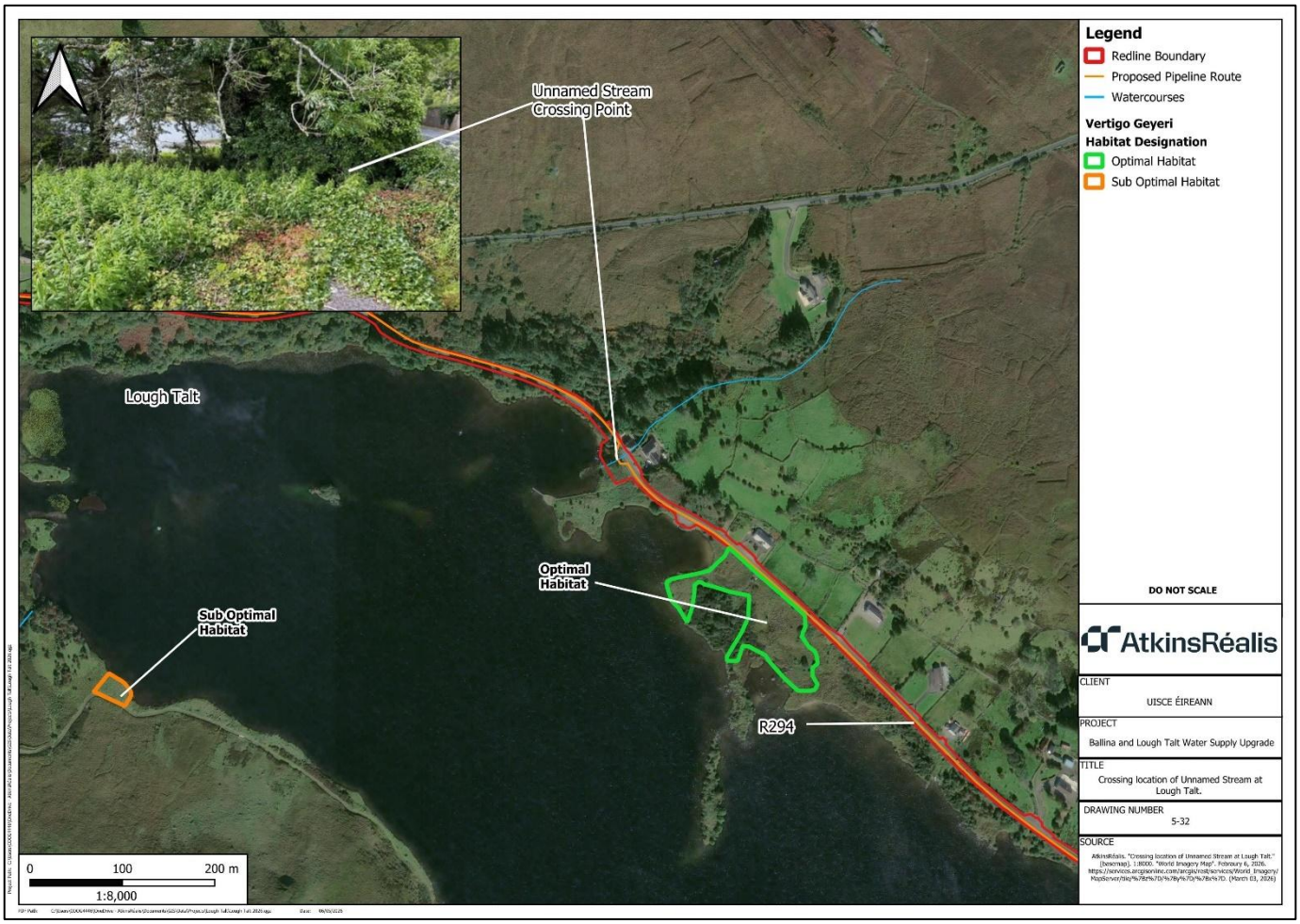



**Figure 4-5 – Crossing location of unnamed stream at Lough Talt and location of *V. geyeri* habitat**

### 4.2.1.4 Indirect Connectivity to European Sites

There is also indirect hydrological connectivity between the Proposed Development and the European sites identified above. In addition to the Moy Estuary and Brusna River crossings, the proposed pipeline will traverse sixteen streams and twelve field drains, most of which ultimately discharge to European sites.

On the western side of Ballina, six of these surface water features flow into Killala Bay/Moy Estuary SAC/SPA, while one flows directly into the River Moy, within River Moy SAC, just south of the estuary.

East of Ballina, nine surface water features connect to the Brusna River, which forms part of the River Moy SAC. The Brusna River flows to the River Moy Estuary within the Killala Bay/Moy Estuary SAC/SPA.

Within the Ox Mountains, the pipeline will cross one Unnamed Stream and seven field drains, all of which outfall to Lough Talt, which is within Lough Hoe Bog SAC.

A detailed description of the hydrological pathways linking the Proposed Development to these European sites is provided in Section 4.4, which also summarises the site survey findings at each identified watercourse crossing.

## 4.3 Non-Qualifying Interest Annex I Habitats

Annex I habitats were reviewed in the context of the Proposed Development. These are habitats listed on Annex I to the Habitats Directive and for which Member States must designate SACs. The overall objective of the Habitats Directive is to achieve and maintain favourable conservation status for all habitats and species of community interest; and to contribute towards maintaining biodiversity of natural habitats and of wild flora and fauna in member states. To this end, EU member states are obliged to monitor the conservation status of habitats and species. As all habitats (as listed in Annex I) and species of Community interest are included, the monitoring requirements obliged to be undertaken by member states is not restricted to European sites (SACs and SPAs) but encompasses the total national resource of each habitat. Consequently, data on Annex I habitat must be collected both within and outside the Natura 2000 network. In addition, member states are obliged, as detailed in Article 17 of the Habitats Directive, to report to the EU commission every six years on the implementation of measures taken towards meeting the objectives of the directive. Annex I habitats are categorised into the following general habitat categories: - Bogs, mires and fens, Coastal habitats, Dunes habitats, Forests, Freshwater habitats, Grasslands, Heath and scrub and Rocky habitats.

A review of NPWS Article 17 datasets[2] (last accessed 16/02/2026) identifies the proposed pipeline route is aligned under and alongside Non-Qualifying Interest Annex I habitats where it crosses the Ox Mountains.

The pipeline route follows existing roadways through the Ox Mountains, adjacent to the Lough Hoe Bog SAC. NPWS datasets identify Annex I Wet Heath [4010] and Dry Heath [4030] habitats in this part of the mountains; which occur outside the boundary of the Lough Hoe Bog SAC. The same datasets also map these areas outside the SAC as Annex I Blanket Bog habitat [7130].

The proposed Windy Gap Break Pressure Tank (BPT) site is located within an area mapped by NPWS as non-qualifying Annex I Wet Heath, Dry Heath, and Blanket Bog habitats, all situated outside of any SAC boundary. It should be noted that NPWS datasets are not fully comprehensive, site survey evidence (2024) confirms that the Windy Gap Site for the proposed Break Pressure Tank has conformity to uniform Cutover blanket bog.

Throughout this section in the OX Mountains, the pipeline itself is routed entirely along existing road infrastructure (R294 and wind farm roadways), thereby the pipeline avoids any direct interaction with heath or blanket bog habitats.

In addition, NPWS datasets identify a small area of non-qualifying Annex I Alkaline Fen habitat [7230] along the eastern shore of Lough Talt within the Lough Hoe Bog SAC. In this location, the pipeline follows the R294, ensuring no direct or indirect interaction with the fen habitat. The locations of non-qualifying interest Annex I heath, bog and fen habitats is illustrated in Figure 4-6 below.

[2] https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17 - It is acknowledged that this is not a definitive list as the NPWS datasets are incomplete.

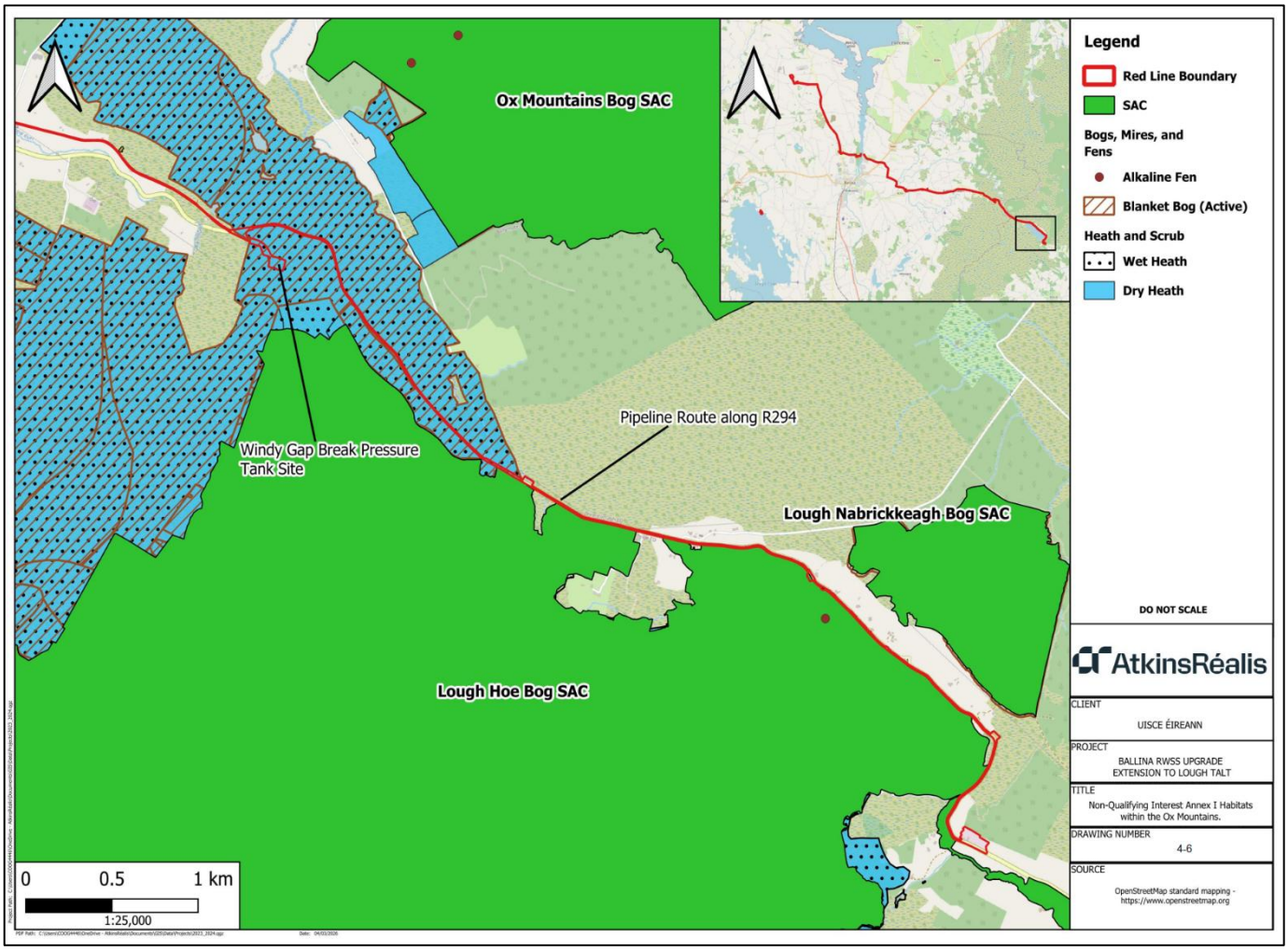



**Figure 4-6 – Non-Qualifying Interest Annex I Habitats within the Ox Mountains**

# 4.4 Surface Water Features

## 4.4.1 Watercourse Crossings

As it traverses through Counties Mayo and Sligo, the Proposed Development's new approx. 30.25 km pipeline will cross thirty surface water features; eighteen EPA identified watercourses and twelve field drains as identified from field surveys, EPA and Tailte Eireann datasets (it is noted that some of the smaller streams and many of the field drains were dry at the time of surveying).

The majority of the watercourses and field drains crossed by the alignment of the proposed pipeline are within the River Moy subcatchment, and they all flow via various tributaries into the Moy Estuary.

The watercourse crossing points of the Proposed Development are outlined below in Table 4-1 and Figure 4-7. Table 4-1 also details the Water Framework Directive (WFD) water quality status and risk status as detailed in EPA datasets.

The larger watercourses that are intersected by the Proposed Development, as well as the two lough waterbodies connected to the Proposed Development are discussed in greater detail below.

The majority of the EPA watercourses will be crossed using trenchless techniques (pipe jacking or directional drilling). The largest watercourse within proximity to the Proposed Development is the River Moy Estuary at north Ballina, in this area the Proposed Development will utilise an existing watermain located under estuary between Belleek Woods and Quay Village. It is noted that this existing sub-estuarine pipeline is outside of the boundary of the Proposed Development. The pipeline crosses one large order watercourse; the Brusna River, which will be crossed via Horizontal Directional Drilling (HDD) techniques. Trenchless technique 'pipe jacking' is a preferred methodology for crossing of the other small order watercourses. Open cut methodology is the preferred option for crossing field drains in roadways, many of which are dry.

Pipe Jacking Methodology**:** Pipe jacking is a trenchless technique that allows the installation of a pipeline beneath a surface water feature without direct excavation through the watercourse. The method requires the construction of a jacking pit and a reception pit located at safe distances from the water feature. Hydraulic jacks within the jacking pit are used to push pre-cast concrete pipes through the ground while soil is excavated at the cutting face using a shield or auger system. Excavated material is removed via conveyor or slurry systems to prevent uncontrolled discharge. The process continues until the pipeline reaches the reception pit, after which seals are installed and the pits are backfilled.

Horizontal Directional Drilling (HDD) Methodology: Horizontal Directional Drilling involves drilling a pilot bore beneath the surface water feature, enlarging the bore, and pulling the pipeline through the prepared alignment. Entry and exit pits are established at appropriate distances from the watercourse to avoid direct disturbance. A steerable drill head creates the pilot bore, which is then reamed to the required diameter. The pre-assembled pipe is pulled through the bore using a drill rig. Drilling fluid, typically bentonite, is used to stabilize the bore and remove cuttings; this fluid is managed within a closed-loop system to prevent environmental contamination.

**Table 4-1 – Surface water drainage watercourse crossings of the Proposed Development[3]**

| EPA Watercourse Name | WFD Status 2019 – 2024 | WFD Risk | On Road / Off Road | Chainage | Crossing Methodology | Watercourse Connectivity to Designated Sites |
|---|---|---|---|---|---|---|
| Moyne | Moderate | Review | On | 880 | Open Cut | Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Newtownwhite | Good | Review | On | 2600 | Trenchless | Killala Bay/Moy Estuary SPA, SAC, pNHA. |
| Broadlands of Knockafarson | Good | Review | On | 2900 | Open Cut | Killala Bay/Moy Estuary SPA, SAC, pNHA. |
| No Name | Good | Review | On | 3520 | Open Cut | Killala Bay/Moy Estuary SPA, SAC, pNHA. |
| Abbeytown | Good | Review | Off | 3720 | Trenchless | Killala Bay/Moy Estuary SPA, SAC, pNHA. |
| No Name | Good | Review | Off | 3880 | Trenchless | Killala Bay/Moy Estuary SPA, SAC, pNHA. |
| Field Drain | n/a | n/a | Off | 5630 | Open Cut | n/a |
| Illanamuck | Moderate | At risk | On | 8020 | Open Cut | River Moy SAC, Killala Bay/Moy Estuary pNHA |
| Moy Estuary | Moderate | At risk | Off | 10200 | Existing duct | Direct Crossing of Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Field Drain of Quignamanger | n/a | n/a | On | 11830 | Trenchless | n/a |
| Field Drain | n/a | n/a | On | 12610 | Open Cut | n/a |
| Glenree / Brosna | Good | Not at risk | Off | 15280 | Trenchless | Direct Crossing of River Moy SAC Connectivity to Killala Bay/Moy Estuary SPA, SAC, pNHA |
| No Name | Moderate | Review | On | 16860 | OC or Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Fiddaun | Moderate | Review | Off | 17220 | Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |

[3] https://gis.epa.ie/EPAMaps/

| EPA Watercourse Name | WFD Status 2019 – 2024 | WFD Risk | On Road / Off Road | Chainage | Crossing Methodology | Watercourse Connectivity to Designated Sites |
|---|---|---|---|---|---|---|
| Srafaungal | Moderate | Review | Off | 17850 | Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Bunnyconnellan West | Moderate | Review | Off | 20470 | Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Field Drain | n/a | n/a | On | 21050 | Open Cut | n/a |
| Srafaungal | Moderate | Review | Off | 21700 | Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| No Name | High | Not at risk | On | 25730 | Open Cut | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Field Drain | n/a | n/a | On | 25810 | Open Cut | n/a |
| No Name | High | Not at risk | On | 25970 | Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Glenree | High | Not at risk | Off | 26280 | Trenchless | River Moy SAC, Killala Bay/Moy Estuary SPA, SAC, pNHA |
| Field Drain | n/a | n/a | On | 27175 | Open Cut | Lough Hoe Bog SAC |
| Field Drain | n/a | n/a | On | 28830 | Open Cut | Lough Hoe Bog SAC |
| No Name | High | Not at risk | Off | 28070 | Trenchless | Lough Hoe Bog SAC |
| Field Drain | n/a | n/a | On | 28350 | Open Cut | Lough Hoe Bog SAC |
| Field Drain | n/a | n/a | On | 28730 | Open Cut | Lough Hoe Bog SAC |
| Field Drain | n/a | n/a | On | 28950 | Open Cut | Lough Hoe Bog SAC |
| Field Drain | n/a | n/a | On | 29295 | Open Cut | Lough Hoe Bog SAC |
| Field Drain | n/a | n/a | Off | 29470 | Open Cut | Lough Hoe Bog SAC |

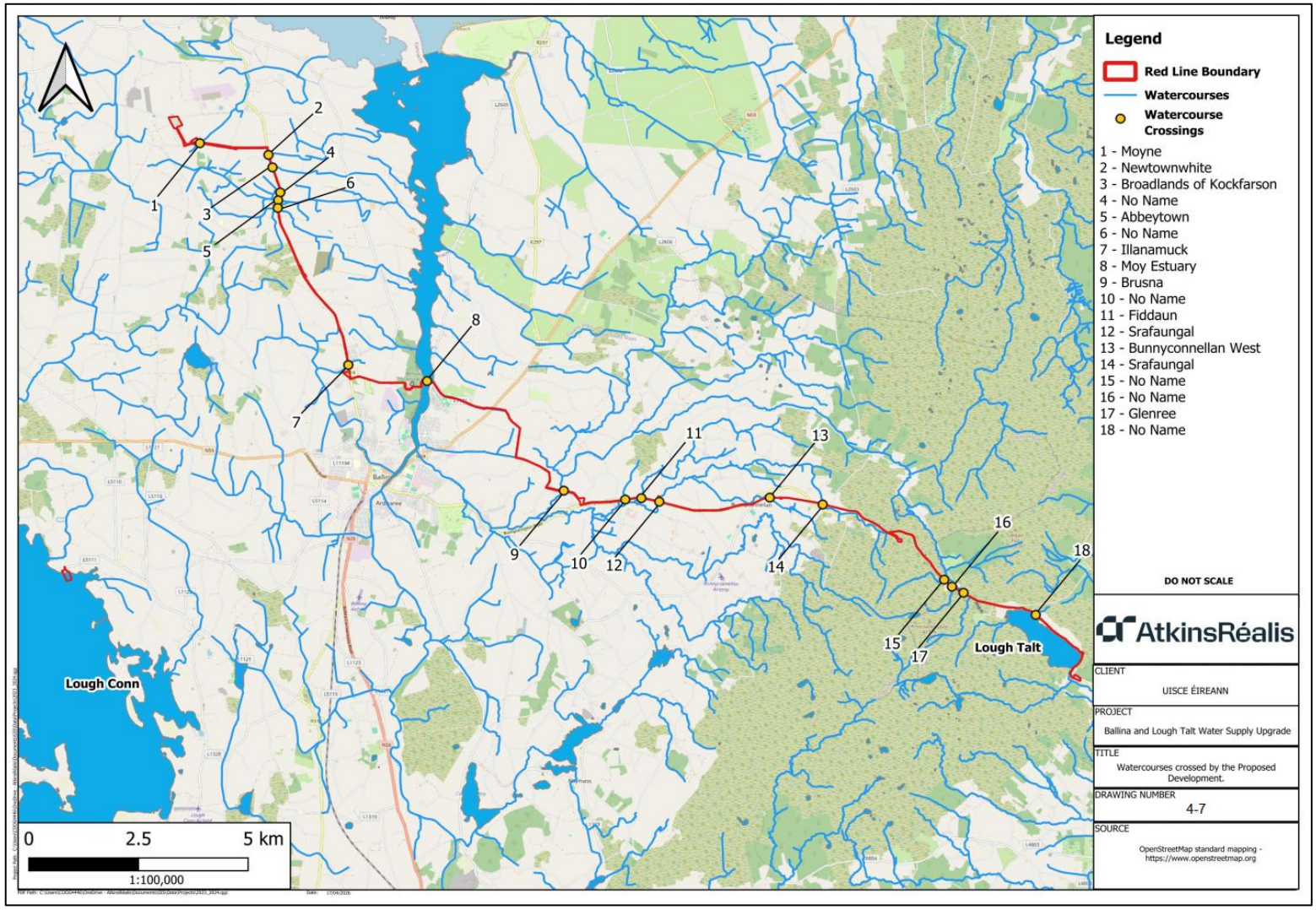



**Figure 4-7 – Watercourses crossed by the Proposed Development**

#### 4.4.1.1 Watercourse Ecology

This section describes the aquatic ecology of the streams and rivers intersected by the proposed pipeline. Information on the ecological condition of these watercourses is based on Inland Fisheries Ireland (IFI) fish survey data where available, supplemented by EPA biological monitoring results for larger rivers. The EPA's Biological Q Rating System is an established method for assessing river quality using macroinvertebrate communities and provides an indication of ecological health by examining the balance between pollution sensitive and pollution tolerant species.

Project specific freshwater surveys carried out in 2024 also inform this assessment. Q-value assessments were completed for all watercourses suitable for macroinvertebrate sampling. Several watercourses could not be assessed due to their very small size, lack of flow, or because they were dry at the time of survey. One stream was excluded for health and safety reasons. The results of the Q-value assessments for all eligible watercourses are presented below. Details of the in-stream and riparian plant species recorded during the site surveys are also included in this section.

**Abbeytown Stream** (Chainage 3720)

Neither IFI or the EPA undertake monitoring or surveying of this watercourse.

Project specific surveys were carried out at the Abbeytown Steam at the proposed crossing point. The Abbeytown Stream was characterised as having 'Poor' status at the time of surveying receiving a Q-value score of 3, as such the stream is considered to be 'Moderately' polluted. The stream is deep relative to the size of the stream with a slow flow. The riverbed is soft mud (approximately 15 cm at its deepest), as such there is no suitable spawning habitat for Salmonids. There is potential habitat for Lamprey ammocoetes within the silt. Lamprey are a QI of Killala Bay/Moy Estuary SAC, no records are available for the area and no lamprey were recorded during the survey. This stream will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the stream. Macroinvertebrate sampling results are provided in Table 4-2. Figure 4-8 is a site photograph of the Abbeytown Stream at the proposed crossing point.

**Table 4-2 – Macroinvertebrate Kick sampling results Abbeytown Stream**

| Taxa | Sensitivity Group* | Abundance |
|---|---|---|
| Gammarus | C | 104 |
| Corixidea | C | 1* |
| Gyrinidae | C | 1* |
| Chironomidae | C | 10 |
| Sialidae | C | 7 |
| *Assellus aquaticus* | D | 80 |
| | **Q-value** | **3** |

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



**Figure 4-8 – Abbeytown Stream at proposed crossing point.**

**River Moy Estuary** (Chainage 10200)

The Moy Estuary lies to the north of Ballina in County Mayo. It is funnel shaped, measuring approximately 3 km wide at the outermost part of the estuary, and covers an area of about 742 ha. Bartragh Island, situated at the seaward limits of the estuary, extends across much of its mouth and provides significant shelter to the water body. Extensive intertidal sand and mudflats are exposed at low tide, offering rich feeding habitats that support a wide variety of waterfowl species

The Moy Estuary was last sampled by the Central and Regional Fisheries Boards (now Inland Fisheries Ireland) in 2008. The results of the survey found that the estuary was important habitat for flounder (*Platichthys flesus*), two-spotted goby (*Gobiusculus flavescens*), sand goby (*Pomatoschistus minutes*), common goby (*Pomatoschistus microps*), plaice (*Pleuronectes platessa*), eel (*Anguilla anguilla*), long-spined sea scorpion (*Taurulus bubalis*), five-bearded rockling (*Ciliata Mustela*), brown trout (*Salmo trutta*), sea trout (*Salmo trutta*), whiting (*Merlangus merlangus*), pollack (*Pollachius pollachius*), gunnel (*Pholis gunnellus*), saithe (*Pollachius virens*), greater pipefish (*Syngathus acus*), three-spined stickleback (*Gasterosteus aculeatus*) and deep-snouted pipefish (*Syngathus typhle*)[4].

The EPA do not undertake biological monitoring of the estuary itself, however they undertake monitoring of the Moy River approx. 1 km upstream of Ardnaree Bridge in Ballina town. EPA biological monitoring undertaken in 2022 (latest available data) detail a Q Value score of 3-4 indicating a ‘Moderate’ biological status (slightly polluted) and ‘Good’ status for Phytoplankton for this waterbody. The Moy Estuary, being a very large waterbody, was not subject to project specific aquatic surveying. It is noted that the pipeline, where it crosses the Moy Estuary will utilise an existing trunk main, as such there will be no works within or interaction with the estuarine waterbody.

[4] Moy Estuary. Sampling Fish for the Water Framework Directive – Transitional Waters 2008. The Central and Regional Fisheries Boards. https://www.fisheriesireland.ie/sites/default/files/2009-09/Moy.pdf

**Brusna River** (Chainage 15280)

The Brusna River is located within the River Moy SAC. The Brusna River rises in the Ox Mountains near Knockasliggaun in Co. Sligo, it flows west through Ballina to join with the River Moy Estuary. The Proposed Development crosses the watercourse north of the confluence of the Brusna and Behy Rivers. Downstream of the confluence the river is classified as a large 6th order watercourse by the EPA.

The Brusna River is not subject to fish surveys by IFI. The EPA undertake biological monitoring of this river approx. 400 m upstream of the proposed pipeline crossing point. EPA biological monitoring undertaken in 2022 (latest available data) detail a Q Value score of 5 indicating a 'High' biological status (unpolluted) and 'Good' status for Invertebrates for this waterbody.

Project specific freshwater surveys (2024) found the river at the crossing point is in good condition with silt free cobble, gravel and sand substrate suitable for salmon spawning. Macroinvertebrate kick sample at this site recorded a Q-4, which is in line with 'Good' status waterbodies. The riparian habitat upstream of the crossing is mostly grassy banks with a willow treeline on the southern bank and a small alder tree and one large ash tree on the north bank. Set back from the northern bank there is also old spoil piles presumably from historic dredging activities. Downstream the riparian habitat is much denser with scrub immediately next to the river backed by a treeline on both banks. The treeline becomes more continuous and established the further downstream from the crossing. A project specific crayfish survey was carried out from approx. 100 m downstream of the Brosna crossing to approx. 100 m upstream. Although there was an abundance of suitable crayfish habitat none were recorded.

This Brusna River will be crossed by trenchless techniques (HDD) and as such there will be no instream works or direct interaction with the river, the HDD launch/reception pits are set back a minimum of 20 m from the river banks. Macroinvertebrate sampling results are provided in Table 4-3. Figure 4-9 is a site photograph of the Brosna River at the proposed crossing point.

**Table 4-3 – Macroinvertebrate Kick sampling results Brusna River**

| Taxa | Sensitivity Group* | Abundance |
|---|---|---|
| *Ecdyonurus* sp. | A | 6 |
| *Dinocras cephalotes* | A | 3 |
| Nemouridae | A | 3 |
| Sericostomatide | B | 3 |
| Odontoceriidae | B | 10 |
| Glossosomatidae | B | 2 |
| Goeridae | B | 2 |
| Gammarus | C | 19 |
| Hydrobidae | C | 5 |
| *Baetis* sp. | C | 2 |
| | **Q-value** | **4** |

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



**Figure 4-9 – Brusna River at proposed crossing point (via HDD) in River Moy SAC**

**Fiddaun Stream** (Chainage 17220) and **Srafaungal Stream** (Chainage 17850)

Neither IFI or the EPA undertake monitoring or surveying of these watercourses. Project specific aquatic surveys were carried out (2024) on the Fiddaun and Srafaungal streams to be crossed by the proposed pipeline. Both streams received a Q-value score of 3 giving a status of 'Poor'.

The eastern bank of the Fiddaun Stream is backed by a garden (amenity grassland) with river bank itself having little vegetation with areas of bare soil with signs of herbicide being used. The western bank has a mature hedgerow containing mostly hawthorn (*Crataegus monogyna*), with dense vegetation at the base of the bank and into the stream which is predominately fool's watercress (*Helosciadium nodiflorum*). The substrate contains cobbles, however, there are high levels of silt between the cobbles the stream bed is very soft in places.

The Srafaungal Stream also contains dense instream macrophytes in this section, within instream vegetation also mostly fool's watercress. However, the river substrate is much cleaner than the Fiddaun with little silt and a mix of gravel and cobbles. There were no signs of salmonids or redds during the survey, however there are some areas of suitable gravel for spawning. The high abundance of macrophytes could cause issues with fluctuating oxygen levels. The stream is bordered by wet grassland on both banks containing meadowsweet (*Filipendula ulmaria*), willowherb (*Chamaenerion angustifolium*), softrush (*Juncus effusus*) and a range of grass species.

Both streams will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the streams or banks. Macroinvertebrate sampling results are provided in Table 4-4. Figure 4-

10 and Figure 4-11 are site photographs of the Fiddaun Stream and Srafaungal Stream at the proposed crossing points.

**Table 4-4 – Macroinvertebrate Kick sampling results of Fiddaun Stream and Srafaungal Stream**

| Taxa | Sensitivity Group | Fiddaun Stream Abundance | Srafaungal Stream Abundance |
|---|---|---|---|
| *Nemouridae* | A | 1 | |
| *Sericostomatide* | B | 2 | 6 |
| *Odontoceriidae* | B | | 2 |
| *Leuctridae* | B | | 2 |
| *Limnephilidae* | B | 1 | |
| Cased caddisfly (Too small to ID in the field) | B | 2 | |
| *Piscicolidae* | C | | 4 |
| *Gammarus* sp. | C | 50 | 45 |
| *Simuliidae* | C | 2 | 15 |
| *Empherellidae* | C | | 4 |
| *Dugesiidae* | C | | 7 |
| *Hydrobidae* | C | | 10 |
| *Baetis* sp. | C | 2 | 3 |
| *Dicranota* | C | | 2 |
| *Coleoptera* Larvae | C | | 4 |
| *Polycentropodidae* | C | 1 | |
| | **Q-value** | **3** | **3** |

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



**Figure 4-10 – Fiddaun Stream at crossing point**



**Figure 4-11 – Srafaungal Stream at crossing point**

**Srafaungal Stream** (Chainage 21700)

Neither IFI or the EPA undertake monitoring or surveying of this watercourse. A project specific aquatic survey was carried out on the Srafaungal Stream at this second crossing point. The riparian habitat at this crossing of the Srafaungal Stream is a combination of wet grassland and sparse deciduous treelines on both banks. Willow is the dominant tree type with some ash present also. There are some conifers present further back from the river on the western side. Other species present include nettles (*Urtica dioica*), Foxglove (*Digitalis purpurea*), Meadowsweet, ferns (*Dryoptera* spp,), hogweed (*Heracleum sphondylium*) and creeping butter cup (*Ranunculus repens*). The rivers substrate is predominantly cobbles with areas of final clean gravel, which offer potential spawning habitat for Salmonids. The macroinvertebrate sample returned a Q-value score of 4 which is representative of a WFD 'Good' status waterbody.

This stream will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the stream or bankside vegetation. Macroinvertebrate sampling results are provided in Table 4-5. Figure 4-12 is a site photograph of the Srafaungal Stream at the proposed crossing point.

**Table 4-5 – Macroinvertebrate Kick sampling results Srafaungal Stream crossing**

| Taxa | Sensitivity Group* | Abundance |
|---|---|---|
| *Rhitrogenia* sp. | A | 3 |
| *Leuctra* | B | 2 |
| *Goeridae* | B | 9 |
| *Dugesiidae* | C | 3 |
| *Baetis* sp. | C | 4 |
| *Dicranota* | C | 2 |
| *Coleoptera* Larvae | C | 2 |
| *Polycentropodidae* | C | 2 |
| *Chironomidae* | C | 1 |
| *Sialidae* | C | 1 |
| *Elimidae* | C | 2 |
| | **Q-value** | **4** |

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



**Figure 4-12 – Srafaungal Stream at second crossing point**

**Glenree Stream** (Chainage 25970)

Neither IFI or the EPA undertake monitoring or surveying of this watercourse. A project specific aquatic survey was carried out on the Glenree Stream. The Glenree Stream originates in the Ox Mountains and flows down for >15 km to conjoin with the Brusna River. The habitat present at this crossing of the Glenree Stream is predominantly blanket bog, however it is being grazed by sheep and so is species poor. The river banks are steep on both sides. Downstream of the road culvert at the crossing point there is a good mix of riffle and glide areas. The substrate is cobbles and boulders with some small areas of gravel. There is limited spawning value due to the sediment being mostly large cobbles and high abundance of filamentous algae being present. Upstream of the road culvert the flow is very slow and the stream is very straight and canalised. Horsetail (*Equisetum arvense*) is growing throughout the stream. The substrate very soft and highly silted. There is no suitable spawning habitat for Salmonids. The macroinvertebrate survey returned a Q-value of 4 which is representative of a 'Good' status water body. However, due to the low abundance of species and high levels of filamentous algae this result should be considered with caution.

This stream will be crossed by trenchless techniques (pipe jacking) and as such there will be no instream works or direct interaction with the stream or banks. Macroinvertebrate sampling results are provided in Table 4-6. Figure 4-13 is a site photograph of the Glenree Stream at the proposed crossing point.

**Table 4-6 – Macroinvertebrate Kick sampling results Glenree Stream**

| Taxa | Sensitivity Group* | Glenree Stream |
|---|---|---|
| *Rhitrogenia* sp. | A | 2 |
| *Nemouridae* | A | 1 |
| *Gammarus* sp | C | 3 |
| *Simuliidae* | C | 1 |
| *Empherellidae* | C | 2 |
| *Baetis* sp. | C | 1 |
| *Polycentropodidae* | C | 1 |
| *Chironomidae* | C | 2 |
| *Elimidae* | C | 1 |
| | **Q-value** | **4** |

(* A= highly sensitive taxa, B= moderately sensitive taxa, C= moderately tolerant taxa, D=highly tolerant taxa)



**Figure 4-13 – Glenree Stream at crossing point**

### 4.4.1.2 Lough waterbodies

This section provides ecological details of the (only) two lough waterbodies within the Proposed Development footprint; Lough Conn and Lough Talt.

#### 4.4.1.2.1 Lough Conn

Lough Conn is the (existing) abstraction point for raw water for the Proposed Development. Lough Conn is located in the Moy catchment in north County Mayo. The lake is connected to its immediate neighbour to the south, Lough Cullin, by a narrow channel that passes under a regional road at Pontoon Bridge. The River Deel flows into Lough Conn and exits Lough Cullin at its southern end near Foxford, just before joining the River Moy which discharges into the Atlantic Ocean at Killala Bay. The lake has a surface area of 4,704ha and a maximum depth of 37.9 m. The lake is categorised as typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4 m), greater than 50 ha and high alkalinity (>100 mg/l CaCO3)[5].

Lough Conn in County Mayo is best classified as a Limestone/Marl Lake (FL3). The lake lies within a catchment dominated by Carboniferous limestone, resulting in base-rich, alkaline conditions that are characteristic of FL3 lake types.

The latest IFI fish survey report[6] (2022) for Lough Conn details the following:-

> 'Lough Conn's reputation as a fine brown trout and salmon fishery goes back to the very beginning of angling in the west of Ireland (O' Reilly, 1998). The main run of spring salmon enters Lough Conn from the end of March and continues right through April. The grilse run begins and May and continues into July (IFI, 2016).
>
> The lake was surveyed by IFI on eight occasions between 1978 and 2013 (1978, 1984, 1990, 1994, 1998, 2001, 2005 and 2013) as part of a brown trout fish stock assessment programme (O' Grady and Delanty, 2001; Delanty and O'Grady, 2014). The lake was also surveyed in 2016 as part of the WFD surveillance programme (Kelly et al., 2017). Brown trout (*Salmo trutta*), rudd (*Scardinius erythrophthalmus*), roach (*Rutilus rutilus*), perch (*Perca fluviatilis*), European eel and pike (*Esox lucius*) were captured in the surveys.
>
> Historically the lake held a population of Arctic char (*Salvelinus alpinus*), however, they have been extinct for some time. Following the apparent collapse of the Arctic char population, IFI surveyed the spawning areas where Arctic char, if present, would be congregating to spawn during the Arctic char spawning seasons of 1991 to 1994. Three Arctic char were captured in the 1991 sampling, one fish in 1992 and none thereafter in 1993 or 1994. An examination of pike stomachs from fish captured in various parts of Lough Conn, throughout the 1990s, found no Arctic char (Igoe, et al., 2000). It is therefore reasonable to assume that Arctic char had become extinct in Lough Conn by the mid-1990s.'

IFI latest fish stock survey identified a total of seven fish species recorded on Lough Conn in 2022. Roach and perch were the two most abundant species captured on Lough Conn in 2022 and they accounted for 88% of all fish captured in the survey. Abundance of roach and perch was relatively similar between 2016 and 2022. The roach population was characterised by a large proportion of larger and older fish while the perch population was dominated by younger year classes in 2022. The report outlines that Lough Conn is an important brown trout fishery. Both the abundance and biomass of brown trout was relatively similar between the 2016 and 2022 surveys. Brown trout ranged in length from 15.9cm to 56.7cm and ranged in age from 1+ to 6+ years, indicating consistent recruitment with persistence of some larger and older individuals. An increase in the proportion of smaller fish (c. 20cm) was observed since 2016,

[5] McLoone, P., Corcoran, W., Bateman, A., Cierpial, D., Gavin, A., Gordon, P., McCarthy, E., Heagney, B., Hyland, J., Robson, S., Kelly, K., and Kelly, F.L. (2023). Fish Stock Survey of Lough Conn, August & September 2022. National Research Survey Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

[6] https://www.fisheriesireland.ie/sites/default/files/2024-01/conn_2022.pdf

indicating that recruitment may have increased in latter years. The 2022 survey found that Lough Conn supports a stable and balanced fish community, dominated by roach and perch, with healthy brown trout recruitment and a consistent presence of other species including Atlantic salmon, eel, tench (*Tinca tinca*), and pike. The 2022 report details Lough Conn has been assigned an ecological status of 'Good' for 2022 based on the fish populations present. Lough Conn was also assigned a fish ecological status of 'Good' in 2016.

IFI have a programme[7] to manage the fish stock in Lough Conn. The principal aim of the 2023 management plan is to remove the predator species pike by electrofishing and gill netting, from the lakes and some of the tributary rivers. The control and removal of non-indigenous, predatory fish such as pike from valuable salmonid fisheries has been practiced for over 100 years in some parts of Ireland. It has been perceived as an important tool in the management of these inland waterways as quality brown trout and salmon fisheries (salmon are noted to be a species associated with River Moy SAC). In Lough Conn, pike are known to have been introduced in relatively recent times. Pike are known to prey on salmon smolts during the spring period. Salmon smolts passing through large lakes on their downward migration are frequently recorded in pike stomachs in Lough Conn (and Cullin) on the Moy system. Pike have been recorded accumulating in significant numbers where in flowing streams enter lakes in spring. There have also been rare incidences of large pike preying on adult salmon in Lough Conn.

Sea lamprey and Brook lamprey, which are both species associated with the River Moy SAC, utilise Loughs Conn (and Cullin) primarily as transitional or resident lake habitats, depending on species and life-history strategy. Sea lamprey (*Petromyzon marinus*), an Annex II species, are anadromous and spend most of their adult life in the marine environment; however, individuals migrating to known spawning sites in the River Moy and its tributaries, including the River Deel, may pass through Lough Conn during their upstream migration in April–June. Lough Conn is not used for spawning or larval development by sea lamprey, with juvenile ammocoetes confined to fine sediments in flowing riverine habitats, rather than lake waterbodies[8]. Brook lamprey (*Lampetra planeri*), a non-parasitic, largely fluvial species, have not been recorded within Lough Conn, though their occurrence in the River Deel suggests possible seasonal passage through lake waters; however, their life cycle is almost entirely river-based[11]. In contrast, a landlocked form of lamprey is known to occur in Lough Conn and other large Irish lakes, including Cullin, Corrib and Derg, and was recorded in Lough Conn during targeted investigations in 2016. These populations complete their full life cycle within lake catchments and tributaries, though little is known about their spawning ecology; spawning is presumed to occur in accessible inflowing streams where adults excavate redds in suitable substrates. Overall, available evidence indicates that Loughs Conn and Cullin function as migration corridors for sea lamprey, have limited importance for brook lamprey, and support a resident landlocked lamprey population, with no records indicating that lake-based activities overlap with sensitive spawning or larval habitats[11].

The white-clawed crayfish (*Austropotamobius pallipes*), another aquatic species associated with River Moy SAC, is widespread in the upper tributaries of the River Moy and the rivers which flow to Loughs Conn and Cullin. This species is absent from the main River Moy and the main bodies of Lough Conn and Lough Cullin. It is noted that crayfish plaque is present within the Moy catchment.

EPA datasets identify the Lake Waterbody WFD Status (2019-2024) is 'Good' for Lough Conn whilst the latest WFD Lake Waterbodies Risk (2019-2024) is 'Under Review'. EPA datasets[9] classifies the Ecological status/potential of Lough Conn as 'Good', with 'High' status for phytoplankton, aquatic flora and has 'High' supporting chemistry conditions (dissolved oxygen, pH, nitrogen, and phosphorous).

As outlined, raw water will be sourced from Lough Conn and treated at Lisglennon WTP. An inlet channel feeds into two separate sumps under the Wherrew RWI&PS. It has been noted that that silt can accumulate in the inlet channel over time which necessitates intermittent maintenance. There is also no fine screen present and no mitigation for

[7] Appropriate Assessment – Screening. Fisheries Stock Management Plan (2023) for Loughs Conn & Cullin. Co. Mayo, Ireland

[8] https://www.fisheriesireland.ie/sites/default/files/2023-02/l.conn_cullin_stock_management_aa_screening2023_0.pdf

[9] https://www.catchments.ie/data/#/waterbody/IE_WE_34_406b?_k=jkuh3w

potential colonisation of the intake and sump by invasive species zebra mussels (*Dreissena polymorpha*). Zebra mussels have been identified as a significant pressure in Lough Cullin, and therefore a threat to Lough Conn exists.

#### 4.4.1.2.2 Lough Talt

Lough Talt is situated in Co. Mayo in the Ox Mountains, between Tobercurry and Ballina in the Moy catchment. The lake has a surface area of 97 ha and a maximum depth of approximately 40 m. The lake is categorised as typology class 8 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4 m), greater than 50 ha and moderate alkalinity (20 to100 mg/l CaCO3)[10].

Lough Talt in County Sligo is best classified as an Acid Oligotrophic Lake (FL2), reflecting its naturally nutrient-poor waters and upland bog-dominated catchment. The lake forms part of the Lough Hoe Bog SAC, an area specifically characterised by oligotrophic lakes within montane bog landscapes.

The lake is also an important habitat for a population of white-clawed crayfish, which is listed on Annex II of the EU Habitats Directive. Lough Talt is recognised as a historically good brown trout (*Salmo trutta*) fishery and holds a population of Arctic char (*Salvelinus alpinus*), a rare and threatened species listed in the Irish Red Data Book for fish as vulnerable[11]. Lough Talt is home to the sole only remaining Arctic char population in the River Moy catchment, perch, eels, and three-spined stickleback are also among the aquatic species found in Lough Talt[12].

Lake Waterbody Status outlined by WFD (2019–2024) lists Lough Talt as having 'Good' status. The latest WFD Lake Waterbodies Risk monitoring data (2019–2024) classifies the Ecological status/potential of Lough Talt as 'Good', with 'High' status for phytoplankton, phytobenthos, fish, and supporting chemistry conditions (dissolved oxygen, pH, nitrogen, and phosphorous).

As Lough Talt is designated as part of the Lough Hoe Bog SAC, detailed hydrogeological investigations were completed as part of the historic Water Abstraction Order (WAO) application process for Lough Talt. The hydrogeological investigations concluded that during periods of extended dry weather or drought, the lake abstraction operation contributes to the lake level dropping, which has an impact on the supporting conditions for the fen habitat of the Geyer's Whorl snail (*Vertigo geyeri*). This snail is an Annex II species of the EU Habitats Directive and is a qualifying interest of Lough Hoe Bog SAC. The minute Geyer's Whorl snail is a species dependent on specific habitat conditions for its survival and spread and is stringent in its habitat requirements, requiring stable hydrological conditions. *V. geyeri* was first found in the fen habitat at Lough Talt in 1992 and in subsequent surveys until 2007. *V. geyeri* has now been lost in the fen habitats surrounding the lough. The most likely cause for extirpation of *V. geyeri* is the reduction of groundwater levels due to abstraction pressures applied to the lake during drought periods (e.g. during summer months). As the lake acts as a hydraulic boundary for groundwater flow in the fen, artesian conditions are lost when the lake level drops, thus preventing groundwater from penetrating the fen's surface.

The overall aim of the Proposed Development is to provide an alternative water supply for the region and to facilitate cessation of abstraction of water from Lough Talt. In addition to the cessation of water abstraction, in order to meet the aims and objectives of Uisce Éireann's Biodiversity Action Plan, which are to help conserve, enhance and work with the natural environment, a plan was developed to mitigate impacts to the fen habitats around Lough Talt and compensate for the loss of *V. geyeri*. Mitigation (irrigation) and compensatory (*V. geyeri* reintroduction) measures have been prescribed. Two mitigation approaches were developed to maintain suitable moisture conditions during prolonged dry periods: the first involves surface irrigation and deep artificial groundwater recharge over approximately 30% – 40% of optimal habitat, with ongoing monitoring and adaptive adjustments to maintain favourable conditions;

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[10] Corcoran, W., Connor, L., McLoone, P., Bateman, A., Cierpial, D., Gavin, A., Gordon, P., McCarthy, E., Putthaaree, D., Twomey, C., Matson, R., Robson, S., Duffy, P., Rocks, K., Donovan, R., Crowley, D., and Kelly, F.L. (2021) Fish Stock Survey of Lough Talt, August 2020. National Research Survey Programme, Inland Fisheries Ireland.

[11] https://www.fisheriesireland.ie/sites/default/files/2021-08/Talt_2020.pdf

[12] https://www.fisheriesireland.ie/sites/default/files/2021-08/Talt_2020.pdf

the second consists of continued monitoring of groundwater level and quality, lake level, fen moisture and rainfall to evaluate habitat performance under abstraction. A four-year management programme accompanies these measures, beginning with testing and deploying the irrigation system and monitoring hydrological and microhabitat conditions; followed in Year 2 by translocation of less sensitive mollusc species and further monitoring alongside consultation with NPWS; then the translocation of *V. geyeri* in Year 3 with continued ecological and hydrological assessment; and finally, from Year 4 onward, a monitoring regime to ensure proper irrigation management and to confirm establishment, reproduction and dispersal of the translocated snail populations through hand searches of monitoring quadrats and suitable microhabitats.

## 4.5 Groundwater Body

The Proposed Development is situated within the Bellacorick-Killala (Code IE_WE_G_0041), Ballina (Code IE_WE_G_0035), and Foxford (Code IE_WE_G_0034) groundwater bodies (GWBs). Sections of the route also pass through the Ballina Gravels Group 1 and Group 2 GWBs. All of these GWBs currently have 'Good' WFD status, with an overall objective to 'Restore' and 'Protect' the current status. The route is predominantly underlain by a locally important aquifer that is moderately productive in local zones, as well as a regionally important karstified aquifer, with some areas underlain by a locally important gravel aquifer. The Ballina Gravel Aquifer and Bunnyconnellan Gravel Aquifer are classified as locally important and a poor aquifer which is generally unproductive except for local zones which also intersects the route. Groundwater vulnerability along the route is primarily 'High', with areas of 'Low', 'Moderate', 'Extreme', and 'Rock at or near Surface or Karst' vulnerability also present. This suggests that bedrock is shallow in these areas and highly susceptible to potential contamination.

## 4.6 Wetland Habitats

A review of Wetland Survey Ireland (WSI) datasets identifies seven wetland sites adjacent to the online/on road sections of the proposed pipeline route as detailed in Table 4-7 below. WSI also provide the wetland habitat type and an evaluation of the wetland site which is included in the table. The Proposed Development pipeline alignment has been specifically developed to avoid direct interaction with any wetland habitat.

Figures 4-14 – 4-16 below show the proposed pipeline route aligned along roadways beside the WSI wetland sites.

**Table 4-7 – Wetland crossing points of the Proposed Development**

| WSI Wetland Site Name (Code) | WSI Site Evaluation | Wetland Type | Connectivity |
|---|---|---|---|
| Coonealcuraun Farm Pond (WMI_MA726) | F-Rating | Lake, Scrub, Wet Grassland | No.<br>The proposed pipeline route follows the R314 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to and from the wetland remain unimpeded. |
| Farrannsculloge Coonealcuraun Cutover (WMI_MA725) | F-Rating | Cutover bog | No.<br>The proposed pipeline route follows the R314 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, |

| WSI Wetland Site Name (Code) | WSI Site Evaluation | Wetland Type | Connectivity |
|---|---|---|---|
| | | | it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to and from the wetland remain unimpeded. |
| Quignashee Cutover (WMI_MA735) | F-Rating | Cutover bog, bog woodland, scrub | No.<br>The proposed pipeline route follows the Behy roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded. |
| Bunnyconnellan East Cutover Complex (WMI_MA596) | F-Rating | Cutover bog, dystrophic lake, scrub | Yes.<br>The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded.<br>The pipeline route diverges for approx. 250m off the R294 onto an existing windfarm gravel track to connect to the proposed new site for the Windy Gap Break Pressure Tank. The new tank site, and also the gravel tracks leading to the new site, are located within bogland habitats within this WSI wetland site. |
| Drumsheen Cutover Complex (WMI_MA595) | C+ Rating | Cutover bog, scrub, wet grassland, dystrophic lake, acid lake, river, wet heath, transition mire, poor fen | Yes.<br>The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded.<br>The pipeline route crosses 3no. small streams which flow into bogland habitat within this wetland site. |
| Tullaghglass Largan Mountain Bog (WMI_SO303) | F-Rating | Lake, River, Wet Heath, Upland Bog | Yes.<br>The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline will be installed within the road sub-base materials, |

| WSI Wetland Site Name (Code) | WSI Site Evaluation | Wetland Type | Connectivity |
|---|---|---|---|
| | | | ensuring that existing groundwater flows to, from or within the wetland remain unimpeded.<br>The pipeline route crosses 1no. small streams which flow into bogland habitat within this wetland site. |
| Tullaghglass Largan South Bog (WMI_SO302) | F-Rating | River, Wet Grassland, Cutover Bog, Fen | No.<br>The proposed pipeline route follows the R294 roadway, which runs alongside this wetland site. Because the pipeline remains entirely within the existing road corridor, it will not directly interact with the wetland. The pipeline route does not cross any watercourses with connectivity to this wetland site. The pipeline will be installed within the road sub-base materials, ensuring that existing groundwater flows to, from or within the wetland remain unimpeded. |

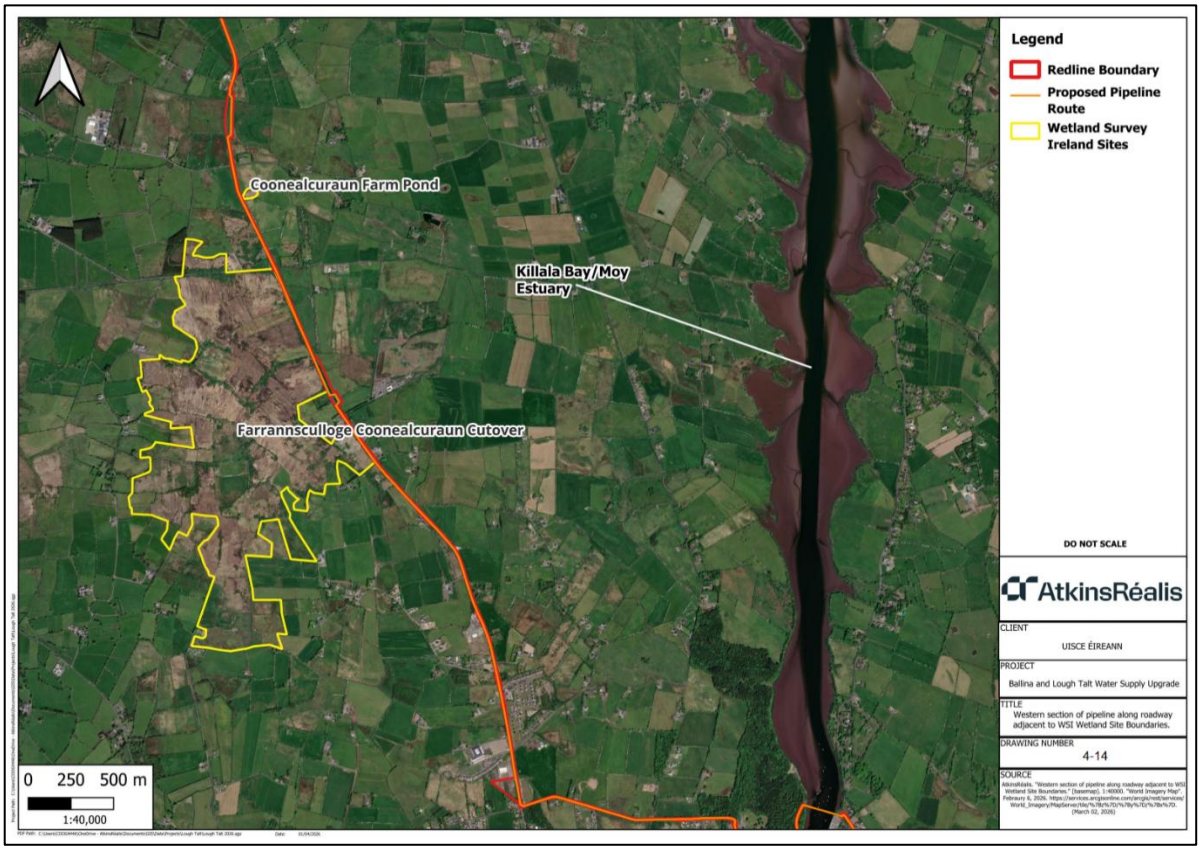



**Figure 4-14 – Western section of pipeline along roadway adjacent to WSI Wetland Site Boundaries**

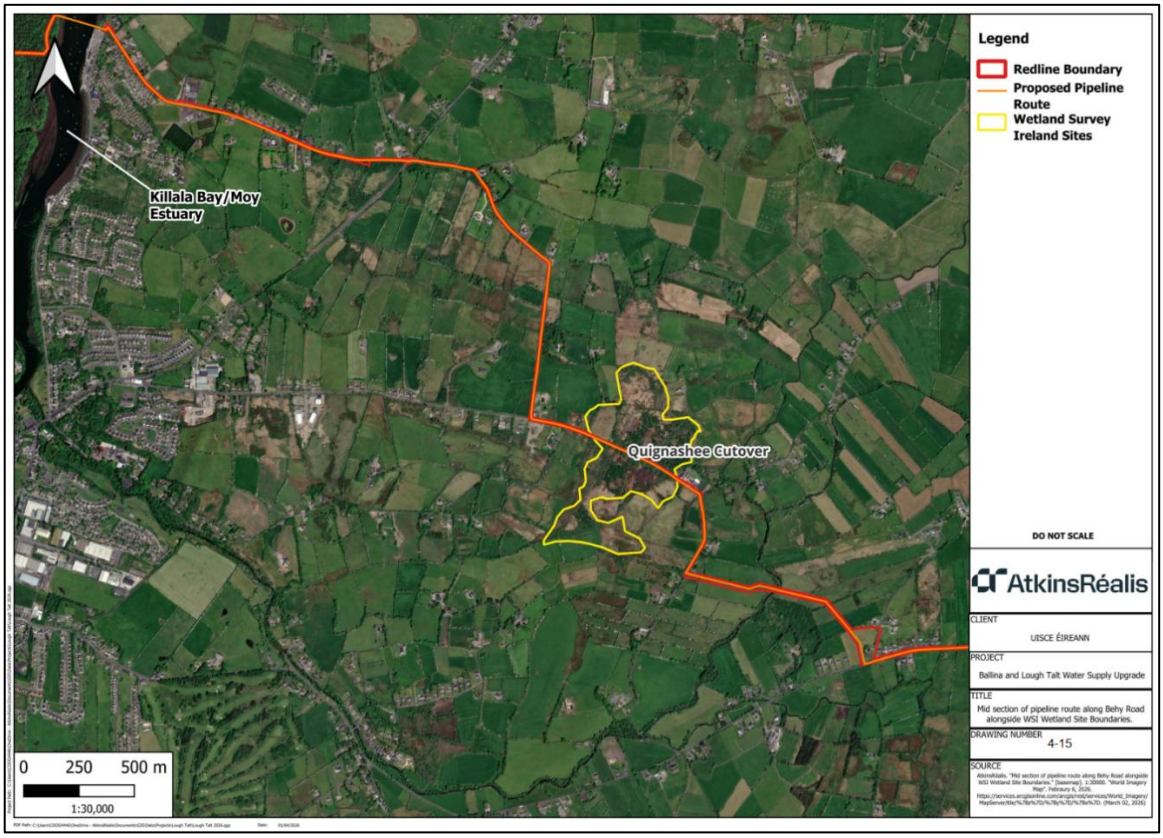



**Figure 4-15 – Mid section of pipeline route along Behy Road alongside WSI Wetland Site Boundaries**

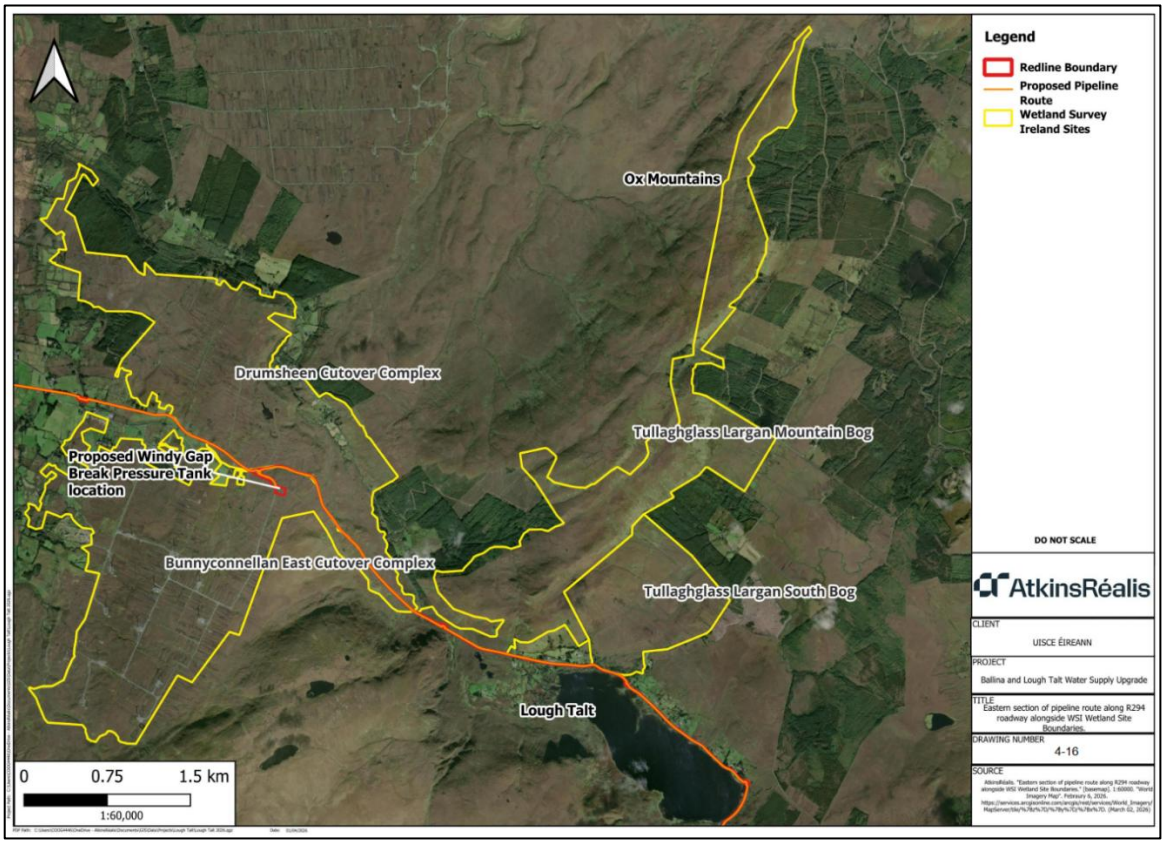



**Figure 4-16 – Eastern section of pipeline route along R294 roadway alongside WSI Wetland Site boundaries**

# 4.7 Bird Sites

### 4.7.1.1 Killala Bay / Moy Estuary

There is one wetland site designated under the Convention on Wetlands, i.e., Ramsar Site, within the red line boundary of the Proposed Development; Killala Bay / Moy Estuary Ramsar Site (Code 843), which covers the same geographical area as Killala Bay / Moy Estuary SPA. The Ramsar Sites Information Service details this bird site as; '*An estuary and intertidal bay separated from the sea by a long sandy island. The site includes a well-developed dune system, saltmarsh, sand and shingle beaches backed by sea-cliffs, and extensive sand and mudflats exposed at low tide. The dunes support a rich and diverse flora that includes several rare or threatened plants. The intertidal flats provide important feeding sites for birds. Brent geese overwinter in the bay in internationally important numbers, and regionally or locally important numbers of several species of waterbirds use the site*.'

The Irish Wetland Bird Survey (I-WeBS) conducts systematic counts and monitoring of waterbirds across a wide range of wetlands throughout Ireland, and Killala Bay is one of the designated I-WeBS count sites. Within the Killala Bay count area (OD407), records of bird species from the two most recent survey periods (2019/2020 and 2020/2021, the latest available data) are summarised below.

Bird species listed on Annex I of the Birds Directive recorded at this site include red-throated diver (*Gavia stellata*), great northern diver (*Gavia immer*), Slavonian grebe (*Podiceps auritus*), cormorant (*Phalacrocorax carbo*), little egret (*Egretta garzetta*), golden plover (*Pluvialis apricaria*), dunlin (*Calidris alpina*), bar-tailed godwit (*Limosa lapponica*), and kingfisher (*Alcedo atthis*).

Red-listed species under Birds of Conservation Concern in Ireland 4 (BoCCI4), excluding Annex I species, include long-tailed duck (*Clangula hyemalis*), common scoter (*Melanitta nigra*), oystercatcher (*Haematopus ostralegus*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), knot (*Calidris canutus*), snipe (*Gallinago gallinago*), black-tailed godwit (*Limosa limosa*), curlew (*Numenius arquata*), and redshank (*Tringa totanus*).

Amber-listed BoCCI4 species, again excluding Annex I species, include mute swan (*Cygnus olor*), whooper swan (*Cygnus cygnus*), shelduck (*Tadorna tadorna*), wigeon (*Mareca penelope*), teal (*Anas crecca*), mallard (*Anas platyrhynchos*), red-breasted merganser (*Mergus serrator*), great crested grebe (*Podiceps cristatus*), shag (*Phalacrocorax aristotelis*), ringed plover (*Charadrius hiaticula*), common sandpiper (*Actitis hypoleucos*), turnstone (*Arenaria interpres*), black-headed gull (*Larus ridibundus*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*), sandwich tern (*Sterna sandvicensis*), and little ringed plover (*Charadrius dubius*).

The Moy Estuary opens into Killala Bay approx. 5.6 km north of the proposed pipeline crossing point. The species listed above occur predominantly within the extensive intertidal habitats of Killala Bay, rather than the much narrower intertidal areas near the proposed crossing location. The Proposed Development will not require any encroachment into intertidal or wetland habitats of the Moy Estuary, as it will utilise an existing trunk main already in place beneath the estuary. In addition, the pipeline route through Belleek Woods is entirely screened from the estuary by dense woodland.

### 4.7.1.2 Lough Conn

An I-WeBS counts site also covers parts of Lough Conn: the Lough Conn I-WeBS count site (Site Code: OD002). Lough Conn is also designated as a Wildfowl Sanctuary (WFS 40), removing it from the Open Season Order and prohibiting the shooting of game birds within the sanctuary.

Within this I-WeBs count site, the following Annex I species were recorded during the 2019/2020 and 2020/2021 winter periods: Greenland white-fronted goose (*Anser albifrons flavirostris*), great northern diver, cormorant, and little egret.

BoCCI4 Red-listed species recorded during the same period, excluding Annex I species, include goldeneye (*Bucephala clangula*), oystercatcher, lapwing, snipe, and curlew.

BoCCI4 Amber-listed species recorded at the site, again excluding Annex I species, include mute swan, whooper swan, greylag goose (*Anser anser*), wigeon, gadwall (*Mareca strepera*), teal, mallard, tufted duck (*Aythya fuligula*), red-breasted merganser, great crested grebe, spotted redshank (*Tringa erythropus*), black-headed gull, common gull, lesser black-backed gull, and herring gull.

The Proposed Development involves the installation of a new raw water intake pipe within a very localised area of north east Lough Conn and as such there will be construction activities only within a small area of the I-WeBS site.

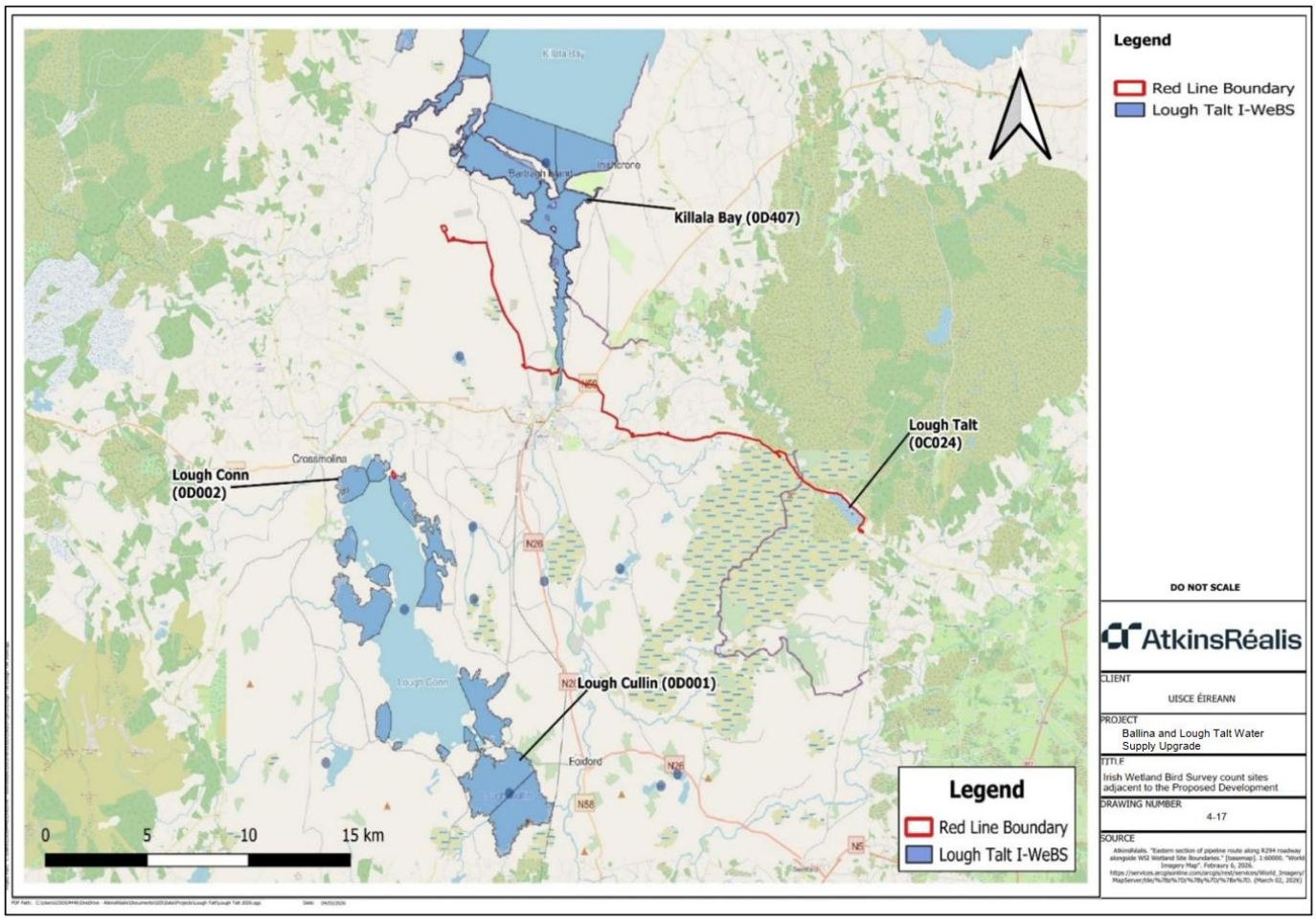



**Figure 4-17 – Irish Wetland Bird Survey count sites adjacent to the Proposed Development**

# 4.8 Species – Site Survey Evidence and Historical Records

This section outlines the species recorded within the Proposed Development site during project specific surveys and also summarises historical species records available from National Biodiversity Data Cantre (NBDC) datasets.

## 4.8.1 Birds

NBDC datasets record twenty five notable bird species within an approx. 1 km radius of the Proposed Development route within the past ten years (2016 to 2026); Three species are listed under Annex I in the EU Birds Directive; common tern, whooper swan, and kingfisher. Species noted to be on the red list of the Birds of Conservation Concern Ireland, other than those listed as Annex I species above include; grey wagtail, kestrel, lapwing, meadow pipit, oystercatcher, snipe, redshank, and swift. Species noted to be on the amber list of the BOCCI, other than those listed as Annex I species above include; common sandpiper, cormorant, goldcrest, herring gull, house martin, house sparrow, mallard, mute swan, sand martin, skylark, starling, swallow, wheatear, and willow warbler.

None of these bird species are listed as Qualifying Interests (QI) for the European Sites with connectivity to the Proposed Development route.

**Table 4-8 – Bird Species recorded within 1km along the Proposed Development route within the past 10 years**

| Species | Scientific Name | Status |
|---|---|---|
| Common Sandpiper | *Actitis hypoleucos* | Amber List |
| Common Tern | *Sterno hirundo* | Annex I/Amber List |
| Cormorant | *Phalacrocorax carbo* | Amber List |
| Goldcrest | *Regulus regulus* | Amber List |
| Grey Wagtail | *Motacilla cinerea* | Red List |
| Herring Gull | *Larus argentatus* | Amber List |
| House Martin | *Delichon urbicum* | Amber List |
| Kestrel | *Falco tinnunculus* | Red List |
| House Sparrow | *Passer domesticus* | Amber List |
| Kingfisher | *Alcedo atthis* | Annex I/Amber List |
| Lapwing | *Vanellus vanellus* | Annex II/Red List |
| Mallard | *Anas platyrhynchos* | Annex II/Amber List |
| Meadow Pipit | *Anthus pratensis* | Red List |
| Mute Swan | *Cygnus olor* | Amber List |
| Oystercatcher | *Haematopus ostralegus* | Red List |
| Redshank | *Tringa totanus* | Red List |
| Sand Martin | *Riparia riparia* | Amber List |
| Skylark | *Alauda arvensis* | Amber List |
| Snipe | *Gallinago gallinago* | Annex II/Red List |
| Starling | *Sturnus vulgaris* | Amber List |
| Swallow | *Hirundo rustica* | Amber List |
| Swift | *Apus apus* | Red List |

| Species | Scientific Name | Status |
|---|---|---|
| Wheatear | *Oenanthe oenanthe* | Amber List |
| Whooper Swan | *Cygnus cygnus* | Annex I/Amber List |
| Willow Warbler | *Phylloscopus trochilus* | Amber List |

Incidental sightings of birds recorded during walkover surveys from Lisglennon WTP to Lough Talt WTP were common species and included Great Tit (*Parus major*), Swallow (*Hirundo rustica*), Wood Pigeon (*Columba palumbus*), Goldfinch (*Carduelis carduelis*) and Kestrel (*Falco tinnunculus*).

**Breeding Bird Survey**

Delichon Ecology Ltd. was commissioned by AtkinsRéalis to undertake a breeding bird survey at Lough Conn[13] at Wherrew RWI&PS site in June 2024 (Refer to Appendix A). This study comprised walkover surveys incorporating line transect and vantage point methods during the late breeding season (mid to late June 2024). The surveys aimed to assess the presence and distribution of breeding bird species within and surrounding the Wherrew WTP intake area. They also informed an evaluation of the ecological importance of the site and its capacity to support breeding avifauna.

Survey methodology for the Wherrew intake area and its environs included two line transects and three vantage point (VP) surveys. The VPs were positioned to cover the existing intake area as well as the northern shoreline and bay of Lough Conn. All target species; namely Annex I listed species and red and amber-listed Birds of Conservation Concern, were recorded alongside common species potentially sensitive to development. Observations included flightlines, flight duration, direction, and height.

The surveys recorded very low breeding bird abundance and activity across the main northern body of Lough Conn. Although the lake has historically supported breeding Common Scoter (*Melanitta nigra*), Common Gull (*Larus canus*), Lesser Black-backed Gull (*Larus fuscus*) and Common Tern (*Sterna hirundo*), no evidence of breeding habitat or active colonies for these species was identified within the survey area around Wherrew RWI&PS. Small numbers of gull species and Common Terns were recorded overflying the transect and VP areas, indicating that these species likely use the wider lake for foraging and refuge during the breeding season.

The lake margins provided suitable breeding habitat for Grey Wagtail (*Motacilla cinerea*) and Common Sandpiper (*Actitis hypoleucos*), with confirmed breeding activity for both species along exposed rocky shorelines. Summer migrants observed feeding over the survey area included Sand Martin (*Riparia riparia*), House Martin (*Delichon urbicum*), Swallow (*Hirundo rustica*), and Swift (*Apus apus*). While no suitable nesting habitat for these species occurs within the footprint of the surveyed area, the lake and shoreline provide important foraging opportunities.

Typical migrant warblers recorded in fringing scrub and woodland included Willow Warbler (*Phylloscopus trochilus*), Blackcap (*Sylvia atricapilla*), and Whitethroat (*Curruca communis*). Resident breeding species recorded included Reed Bunting (*Emberiza schoeniclus*), Chaffinch (*Fringilla coelebs*), Wren (*Troglodytes troglodytes*), and Linnet (*Linaria cannabina*).

No raptor species were observed during the surveys, and the study area does not provide optimal nesting habitat for such species. Nevertheless, species such as Sparrowhawk (*Accipiter nisus*), Kestrel (*Falco tinnunculus*), Peregrine (*Falco peregrinus*), and Buzzard (*Buteo buteo*) are likely to use the area opportunistically for hunting.

[13] Delichon Ecology Ltd. (2025). Wherrew Water Treatment Plant Intake Breeding Bird Survey 2024.

Red-listed species recorded during the breeding surveys included Grey Wagtail, Meadow Pipit (*Anthus pratensis*), and Swift. All were observed along the lakeshore fringes north and south of the existing WTP intake area. Both Grey Wagtail and Meadow Pipit occurred within suitable breeding habitat and showed probable breeding behaviour.

### 4.8.2 Otter

Otter, a species are listed on Annex II and IV of the EU Habitats Directive, are widespread through the Proposed Development site and have been recorded regularly in Lough Conn, Lough Talt, Brusna River and the Glenree Stream (NBDC).

All watercourses within the Proposed Development site were surveyed for evidence of otter activity, it is noted that otter is a Qualifying Interest (QI) of the River Moy SAC. At the Wherrew RWI&PS on Lough Conn, no definitive signs, such as tracks, spraint, or slides, were recorded; however, the rocky shoreline made otter evidence detection difficult, and otter presence along the lake edge remains likely based on habitat suitability, no otter holts were recorded within 50m of the Proposed Development red line boundary at Lough Conn.

At the Abbeytown Stream crossing, mammal tracks and two slides leading down to the stream were observed, along with indistinct prints on the muddy riverbank, suggesting probable otter use of the watercourse. No holts were identified within 50 m of this crossing.

At the Brusna River crossing, no holts or clear otter signs were recorded, though mammal tracks potentially attributable to otter were noted approx. 70 m downstream of the pipeline crossing point.

In the Ox Mountains, an otter spraint was found on a boulder in the Glenree Stream immediately downstream of the R294 road bridge, and an otter roadkill was recorded approx. 500m east of this location.

Across all watercourses and surveyed sections, no otter holts or couches were identified.

### 4.8.3 Invasive Species

A review of NBDC datasets (2016–2026) was undertaken to identify records of legally restricted Third Schedule invasive species, listed under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011), within 100m of the Proposed Development.

Himalayan knotweed (*Persicaria wallichii*) was recorded in the southern section of Belleek Woods in 2015. Japanese knotweed (*Reynoutria japonica*) was reported at four locations along the Proposed Development corridor in 2015; however, the precise locations are unknown due to a spatial accuracy of 1 km. Rhododendron was recorded within Belleek Woods in 2015 and 2021, and also approx. 100 m south of the pipeline route at the base of the Ox Mountains.

Canadian waterweed (*Elodea canadensis*) was recorded in Lough Conn and Lough Talt in 2008 and is considered likely to remain present. No records occur within 100 m of the proposed intake location at Lough Conn or the Lough Talt WTP. Killer shrimp (*Dikerogammarus villosus*) was recorded approx. 350 m north of the proposed Brusna River crossing along the Glenree watercourse.

Project specific site surveys identified zebra mussel at the existing Wherrew RWI&PS on Lough Conn. The design of the proposed new raw water intake incorporates a specialised coating to prevent zebra mussels from attaching to, and subsequently clogging, the intake infrastructure, an issue commonly associated with this species where it is present.

A substantial stand of Japanese knotweed and Himalayan knotweed, both Third Schedule invasive plant species, are present within Belleek Woods (see Figure 4-18 for mapped location and approximate extent). This extensive

infestation occupies the lawns north of Belleek Castle and extends along the adjoining woodland boundary, where both species occur in high abundance. On the castle lawns, knotweed has been repeatedly mown and forms continuous mature stands along the woodland edge. The proposed pipeline route has been deliberately aligned to avoid all areas affected by knotweed within this part of the woodland.

Cherry laurel is also present within the woodland near the proposed pipeline corridor and is widespread throughout Belleek Woods. However, the proposed works will not require any encroachment into areas where cherry laurel occurs. Other invasive species historically recorded within the woodland include rhododendron, winter heliotrope (*Petasites fragrans*), snowberry (*Symphoricarpos albus*), Himalayan honeysuckle (*Leycesteria formosa*), montbretia (*Crocosmia × crocosmiiflora*), and bamboo (*Bambusoideae* spp.).

During site surveys, a small stand of Japanese knotweed was also identified near Culleens National School, located within scrub adjacent to the R314 and outside the Proposed Development red line boundary. This stand is already marked with a “Do Not Cut” notice, and, as with the infestation in Belleek Woods, the proposed works will not require any encroachment into this area.

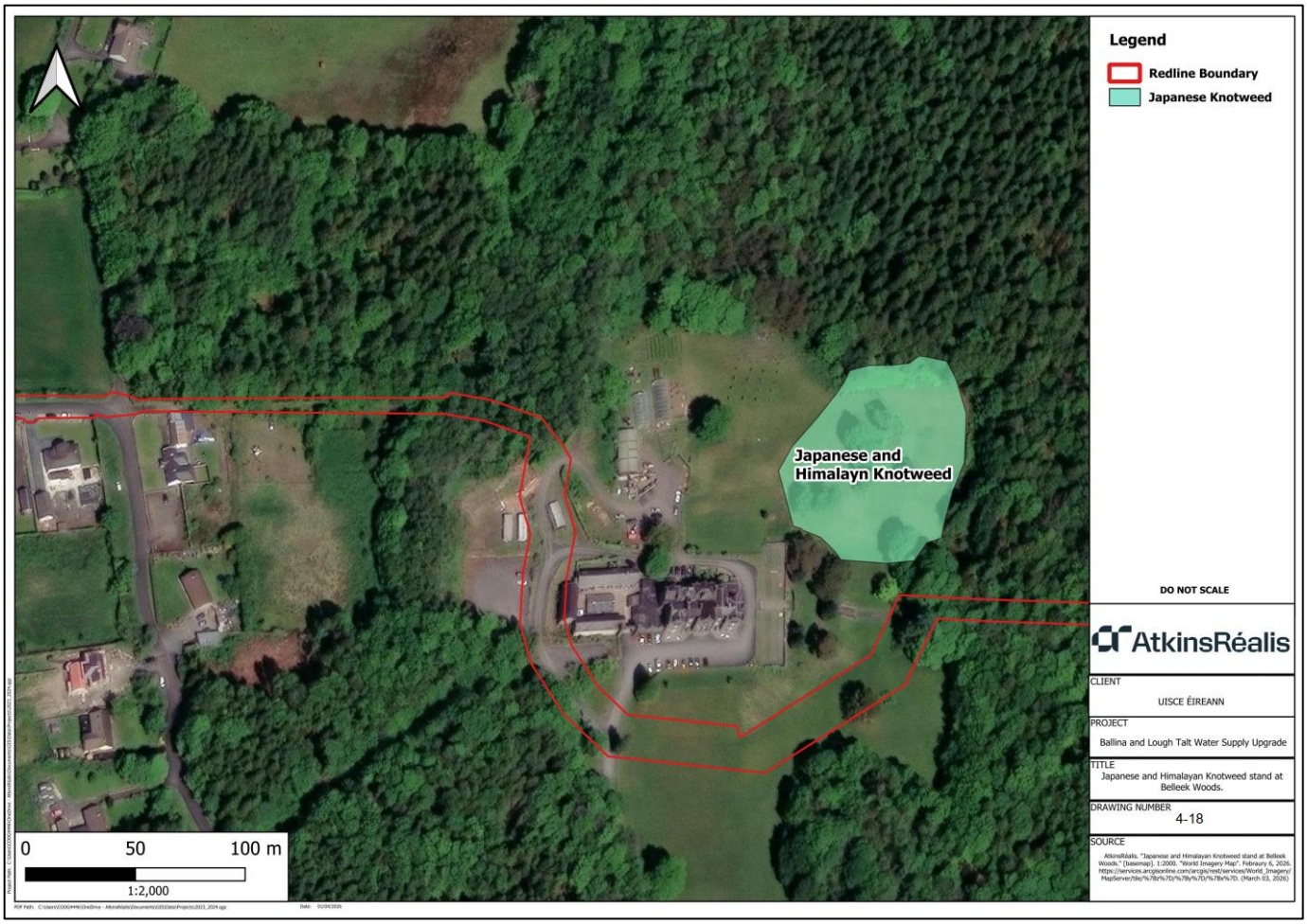



**Figure 4-18 – Japanese and Himalayan Knotweed stand at Belleek Woods**

## 4.9 Site Compound

A site compound is proposed on a brown field site near Culleens village in County Mayo.

The primary habitat within the proposed compound site consists of spoil and bare ground (ED2), with large spoil heaps occurring along the eastern boundary of the brownfield site. Hardstanding gravel surfaces (BL3) are located at the northern end of the compound site which will be the main are utilised for the Proposed Development. Extensive areas of recolonising bare ground (ED3) are also present. Scattered patches of scrub (WS1), dominated by gorse and willow, occur throughout the mid and southern areas of the compound site.

Two unfinished steel-framed warehouse structures are situated in the central and north-western sections of the compound site. To the east, a low cut landscape feature beech hedgerow (WL1) is present along the roadside behind a diffuse landscaped treeline (WL2) composed of young broadleaved trees. A mature treeline forms the southern boundary of the compound. An operational warehouse and associated hardstanding car park lie immediately to the north. No boundary trees or hedgerows will be removed.

The Illanamuck Stream (FW2) is located approx. 150 m north of the proposed compound and is culverted beneath the Oaklawn roadway. There is no potential connectivity between the proposed compound site and this watercourse.

This proposed site compound location has no indirect connectivity to any European site and the storage of plant and equipment and general usage of the compound site will have no effects on any European site.

# 5. Appropriate Assessment Screening

## 5.1 Source-Pathway-Receptor

Appropriate Assessment screening requires a clear and systematic evaluation of whether the Proposed Development may give rise to likely significant effects on any European site. In line with current best practice, including the Office of the Planning Regulator's Practice Note PN01 (2021), the screening process is based on a source–pathway–receptor (SPR) model rather than reliance on predefined geographic distances or broad zones of influence.

Under the SPR model, the screening exercise identifies:

- **Sources** - the elements of the Proposed Development capable of exerting pressures or producing effects (e.g., emissions, habitat loss, noise, lighting, hydrological changes).
- **Pathways** - the mechanisms or connections through which an effect could be transmitted from the source to ecological receptors (e.g., surface water links, groundwater connectivity, air, disturbance pathways, functional ecological linkages).
- **Receptors** - the ecological features that could be affected, specifically the Qualifying Interests and Conservation Objectives of European sites.

Effects can only arise where all three components of the chain are present. If any one of the links; source, pathway, or receptor is absent or can be objectively ruled out, the potential for significant effects can likewise be excluded.

In establishing which European sites require consideration in AA Screening, the screening process therefore focuses on the existence or absence of viable pathways between the Proposed Development and the features for which each European site is designated. This approach reflects OPR (2021), which notes that reliance on arbitrary distance thresholds (e.g., 15km) is inappropriate unless supported by hydrological, ecological, or functional linkages.

Earlier guidance such as Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (DEHLG, 2010) identified three broad categories of sites that need to be included in screening. These remain relevant through the SPR approach:

1. European sites within or adjacent to the development area, where there is the potential for direct effects.
2. European sites connected by identifiable pathways, which may include hydrological networks, ecological corridors, or functional linkages for mobile species (e.g., feeding, roosting, or commuting habitats).
3. Any European sites where, applying the precautionary principle, the possibility of significant effects cannot be excluded, for example where hydrological connectivity extends throughout a river catchment or where mobile fauna associated with a Natura site may utilise habitats within or near the Proposed Development site.

The European Commission's (2021) guidance on Article 6(3) further emphasises the need to consider:

- Faunal mobility, whereby species of conservation interest may use areas outside the designated site and could be affected by changes in habitat, disturbance, or severance of ecological linkages.
- Connectivity within and between European sites, including whether a development could interrupt functional ecological pathways essential to the achievement of site conservation objectives.

By applying these principles, the screening process identifies all European sites with a potential for significant effects, while avoiding the unnecessary inclusion of sites where no such connections exist.

The Proposed Development is within the following European sites; River Moy SAC, Lough Conn and Lough Cullin SPA, Killala Bay/Moy Estuary SAC and Killala Bay/Moy Estuary SPA. The Proposed Development is also adjacent to Lough Hoe Bog SAC.

Other potential connectivity from the Proposed Development to European sites is through the following pathways:

- Hydrological – effects via surface water quality; or,
- Hydrogeological – effects via groundwater.

Consideration has also been given to species which may occur at a distance from the SAC or SPA for which they are a Qualifying Interest (QI). Many SAC Qualifying Interest species (e.g. otters, aquatic species) and Special Conservation Interest (SCI) SPA waterbirds and wildfowl have a wide geographical range, therefore, the mobility of QI or SCI species and their potential to range outside of the delineated boundaries of their respective European sites has also been considered as part of this assessment.

Table 5-1 details all European sites considered in the source–pathway–receptor appraisal and indicates whether any connectivity to the Proposed Development exists. Figures 5-1 and 5-2 illustrate the locations of the European sites included in this evaluation.

**Table 5-1 – European Sites assessed for potential connectivity to the Proposed Development**

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| River Moy SAC (002298)[14] | Within the Proposed Development site | ▪ Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]<br>▪ Active raised bogs [7110]<br>▪ Degraded raised bogs still capable of natural regeneration [7120]<br>▪ Depressions on peat substrates of the *Rhynchosporio*n [7150]<br>▪ Alkaline fens [7230]<br>▪ Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]<br>▪ Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]<br>▪ *Austropotamobius pallipes* (White-clawed Crayfish) [1092]<br>▪ *Petromyzon marinus* (Sea Lamprey) [1095]<br>▪ *Lampetra planeri* (Brook Lamprey) [1096]<br>▪ *Salmo salar* (Salmon) [1106]<br>▪ *Lutra lutra* (Otter) [1355] | Yes.<br>There is direct connectivity between the Proposed Development and the River Moy SAC. The development includes the abstraction of water from Lough Conn at the Wherrew RWI&PS, as well as construction activities along the shoreline and within the lough itself. Because Lough Conn forms part of the River Moy SAC, these works create a direct pathway between the development and the designated site.<br>In addition, the proposed pipeline will cross the SAC at the River Brusna. The route will also intersect ten other watercourses, all of which ultimately drain into the River Moy SAC.<br>Accordingly, the Proposed Development has both direct and indirect connectivity to the River Moy SAC. A more detailed discussion of this designated site is provided below. |

[14] NPWS (2016) *Conservation Objectives: River Moy SAC 002298. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| Killala Bay/Moy Estuary SAC (000458)[15] | Within the Proposed Development site | ▪ Estuaries [1130]<br>▪ Mudflats and sandflats not covered by seawater at low tide [1140]<br>▪ Annual vegetation of drift lines [1210]<br>▪ Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]<br>▪ *Salicornia* and other annuals colonising mud and sand [1310]<br>▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]<br>▪ Embryonic shifting dunes [2110]<br>▪ Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]<br>▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]<br>▪ Humid dune slacks [2190]<br>▪ *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]<br>▪ *Petromyzon marinus* (Sea Lamprey) [1095]<br>▪ *Phoca vitulina* (Harbour Seal) [1365] | Yes.<br>The proposed pipeline route is in close proximity to Killala Bay/Moy Estuary SAC to the east of Belleek Woods, creating a connection between the Proposed Development site and this estuarine designated area. The route also intersects additional watercourses, all of which discharge into the Killala Bay/Moy Estuary SAC (via watercourses within or connected to River Moy SAC).<br>Consequently, the Proposed Development site establishes both direct and hydrological connectivity with this SAC. This site is discussed further below. |

[15] NPWS (2012) *Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| Lough Conn and Lough Cullin SPA (004228)[16] | Within the Proposed Development site | ▪ Tufted Duck (*Aythya fuligula*) [A061]<br>▪ Common Scoter (*Melanitta nigra*) [A065]<br>▪ Common Gull (*Larus canus*) [A182]<br>▪ Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]<br>▪ Wetland and Waterbirds [A999] | Yes.<br>There is direct connectivity between the Proposed Development site and Lough Conn and Lough Cullin SPA. The Proposed Development will result in water abstraction from Lough Conn at the Wherrew RWI&PS. Also, construction activities are proposed within Wherrew RWI&PS, which is within the SPA. The Proposed Development also includes for the installation of water abstraction pipes within Lough Conn waterbody.<br>This site is discussed further below. |
| Killala Bay/Moy Estuary SPA (004036)[17] | Within the Proposed Development site | ▪ Ringed Plover (*Charadrius hiaticula*) [A137]<br>▪ Golden Plover (*Pluvialis apricaria*) [A140]<br>▪ Grey Plover (*Pluvialis squatarola*) [A141]<br>▪ Sanderling (*Calidris alba*) [A144]<br>▪ Dunlin (*Calidris alpina*) [A149]<br>▪ Bar-tailed Godwit (*Limosa lapponica*) [A157]<br>▪ Curlew (*Numenius arquata*) [A160]<br>▪ Redshank (*Tringa totanus*) [A162]<br>▪ Wetland and Waterbirds [A999] | Yes.<br>The proposed pipeline route is in close proximity to Killala Bay/Moy Estuary SPA to the east of Belleek Woods, thereby providing connectivity between the Proposed Development site and this European Site. The proposed pipeline route also crosses watercourses which flow into Killala Bay/Moy Estuary SPA.<br>This site is discussed further below. |

[16] NPWS (2022) *Conservation objectives for Lough Conn and Lough Cullin SPA [004228]. First Order Site-specific Conservation Objectives Version 1.0*. Department of Housing, Local Government and Heritage.

[17] NPWS (2013) *Conservation Objectives: Killala Bay/Moy Estuary SPA 004036. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| Lough Hoe Bog SAC (000633)[18] | Adjacent to the Proposed Development site | ▪ Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]<br>▪ Blanket bogs (* if active bog) [7130]<br>▪ *Vertigo geyeri* (Geyer's Whorl Snail) [1013]<br>▪ *Austropotamobius pallipes* (White-clawed Crayfish) [1092] | Yes.<br>A section of the proposed pipeline route is aligned directly alongside the boundary of Lough Hoe Bog SAC at Lough Talt for *c*. 4 km and crosses one unnamed small stream which flows into Lough Talt thereby providing potential connectivity between the Proposed Development site and this SAC. This site is discussed further below. |
| Lough Nabrickkeagh Bog SAC (000634)[19] | 160 m | ▪ Blanket bogs (* if active bog) [7130] | No.<br>There is no direct overlap between the Proposed Development site and Lough Nabrickkeagh Bog SAC. This SAC is uphill of the pipeline route in the region of the R294 at Lough Talt. There is no indirect connectivity between the Proposed Development site and this SAC via groundwater, watercourses, drains, ditches or any other vectors.<br>Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |

[18] NPWS (2017) *Conservation Objectives: Lough Hoe Bog SAC 000633. Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

[19] NPWS (2019) *Conservation Objectives: Lough Nabrickkeagh Bog SAC 000634.Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| Ox Mountains Bog SAC (002006)[20] | 700 m | ▪ Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]<br>▪ Natural dystrophic lakes and ponds [3160]<br>▪ Northern Atlantic wet heaths with *Erica tetralix* [4010]<br>▪ European dry heaths [4030]<br>▪ Blanket bogs (* if active bog) [7130]<br>▪ Transition mires and quaking bogs [7140]<br>▪ Depressions on peat substrates of the *Rhynchosporion* [7150]<br>▪ *Vertigo geyeri* (Geyer's Whorl Snail) [1013]<br>▪ *Saxifraga hirculus* (Marsh Saxifrage) [1528] | No.<br>There is no direct overlap between the Proposed Development site and Ox Mountains Bog SAC. This SAC is uphill of the pipeline route in the region of the R294. There is no indirect connectivity between the Proposed Development site and this SAC via groundwater, watercourses, drains, ditches or any other vectors.<br>Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |
| Lackan Saltmarsh and Kilcummin Head SAC (000516)[21] | 7.54 km | ▪ *Salicornia* and other annuals colonising mud and sand [1310]<br>▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]<br>▪ Mediterranean salt meadows (*Juncetalia maritimi*) [1410]<br>▪ Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]<br>▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] | No.<br>There is no direct overlap between the Proposed Development site and Lackan Saltmarsh and Kilcummin Head SAC.<br>Surface waters from the Proposed Development site flow to the River Moy Estuary and not to Lackan Saltmarsh and Kilcummin Head SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors. |

[20] NPWS (2016) *Conservation Objectives: Ox Mountains Bogs SAC 002006. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

[21] NPWS (2016) *Conservation Objectives: Lackan Saltmarsh and Kilcummin Head SAC 000516. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| | | | Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |
| Bellacorick Bog Complex (001922)[22] SAC | 9.25 km | ▪ Natural dystrophic lakes and ponds [3160]<br>▪ Northern Atlantic wet heaths with *Erica tetralix* [4010]<br>▪ Blanket bogs (* if active bog) [7130]<br>▪ Depressions on peat substrates of the *Rhynchosporion* [7150]<br>▪ Alkaline fens [7230]<br>▪ *Vertigo geyeri* (Geyer's Whorl Snail) [1013]<br>▪ *Saxifraga hirculus* (Marsh Saxifrage) [1528] | No.<br>There is no direct overlap between the Proposed Development site and Bellacorick Bog Complex SAC.<br>Surface waters from the Proposed Development site flow to the River Moy Estuary and not to Bellacorick Bog Complex SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors.<br>Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |
| Glenamoy Bog Complex (000500)[23] SAC | 12.3 km | ▪ Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]<br>▪ Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] | No.<br>There is no direct overlap between the Proposed Development site and Glenamoy Bog Complex SAC. |

[22] NPWS (2017) *Conservation Objectives: Bellacorick Bog Complex SAC 001922.Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

[23] NPWS (2017) *Conservation Objectives: Glenamoy Bog Complex SAC 000500. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| | | ▪ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]<br>▪ Humid dune slacks [2190]<br>▪ Machairs (* in Ireland) [21A0]<br>▪ Natural dystrophic lakes and ponds [3160]<br>▪ Northern Atlantic wet heaths with *Erica tetralix* [4010]<br>▪ *Juniperus communis* formations on heaths or calcareous grasslands [5130]<br>▪ Blanket bogs (* if active bog) [7130]<br>▪ Transition mires and quaking bogs [7140]<br>▪ Depressions on peat substrates of the *Rhynchosporion* [7150]<br>▪ *Salmo salar* (Salmon) [1106]<br>▪ *Petalophyllum ralfsii* (Petalwort) [1395]<br>▪ *Saxifraga hirculus* (Marsh Saxifrage) [1528]<br>▪ *Hamatocaulis vernicosus* (Slender Green Feather-moss) [6216] | Surface waters from the Proposed Development site flow to the Moy Estuary and not to Glenamoy Bog Complex SAC. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors.<br>Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |
| Turloughmore (Sligo) SAC (000637)[24] | 13.4 km | ▪ Turloughs [3180] | No.<br>There is no direct overlap between the Proposed Development site and Turloughmore (Sligo) SAC.<br>Surface waters from the Proposed Development site flow to the Moy Estuary and not to Turloughmore (Sligo) SAC. There is no |

[24] NPWS (2021) *Conservation Objectives: Turloughmore (Sligo) SAC 000637.Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

| Site Name and Code | Approximate Distance from Proposed Development location | Qualifying Interests / Special Conservation Interests | Connectivity |
|---|---|---|---|
| | | | indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors.<br>Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |
| Newport River SAC (002144)[25] | 14.27 km | ▪ *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]<br>▪ *Salmo salar* (Salmon) [1106] | No.<br>There is no direct overlap between the Proposed Development site and Newport River SAC.<br>Surface waters from the Proposed Development site flow to the Moy Estuary and not to Newport River SAC, the Newport River is not in the same catchment area as the Proposed Development site. There is no indirect connectivity between the Proposed Development site and this SAC via watercourses, drains, ditches, groundwater or any other vectors.<br>Given the lack of any connecting pathways there will be no likely significant effects on this European site as a result of the Proposed Development.<br>This site is not considered further. |

[25] NPWS (2019) *Conservation Objectives: Newport River SAC 002144. Version 1*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

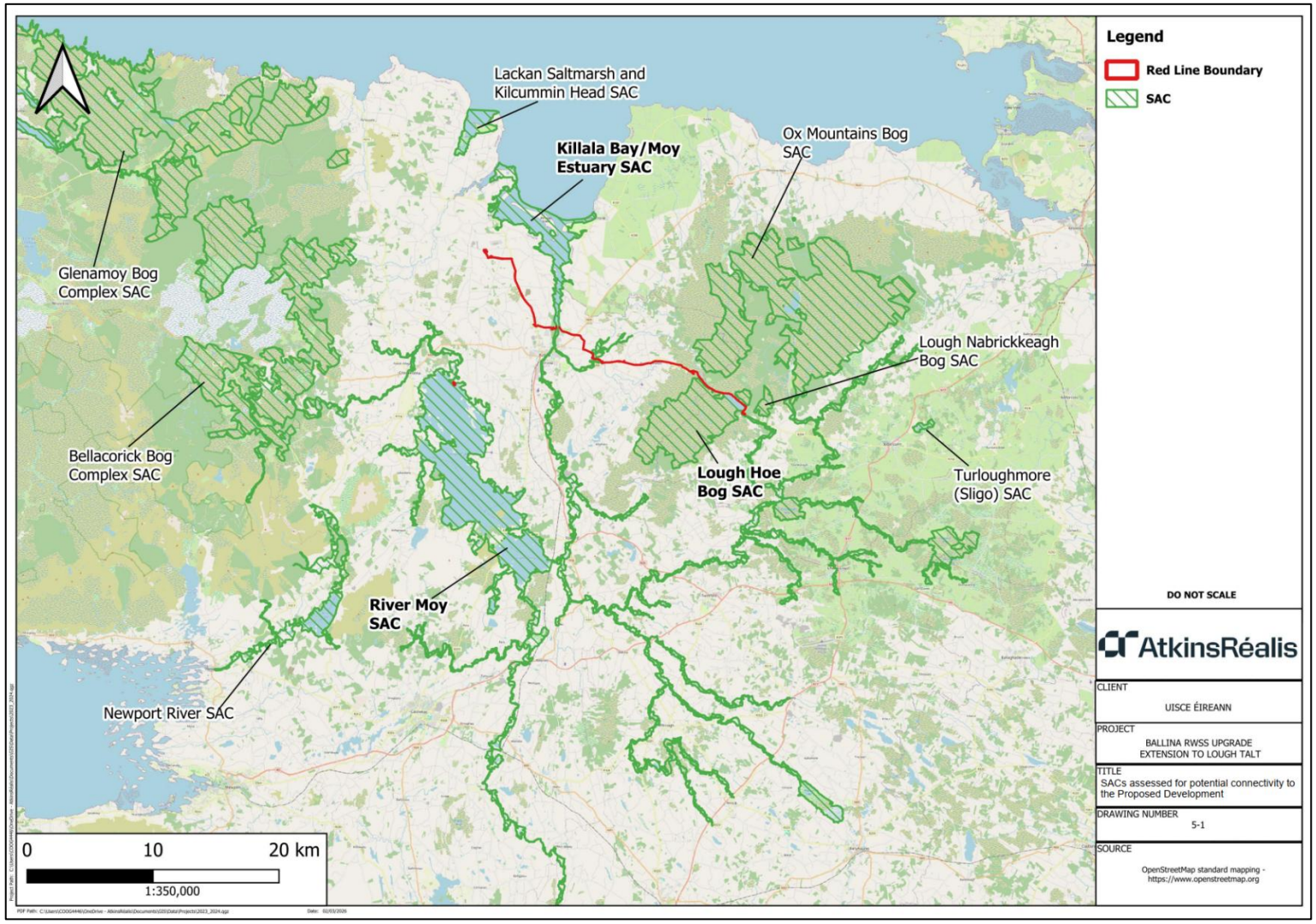



**Figure 5-1 – SACs assessed for potential connectivity to the Proposed Development**

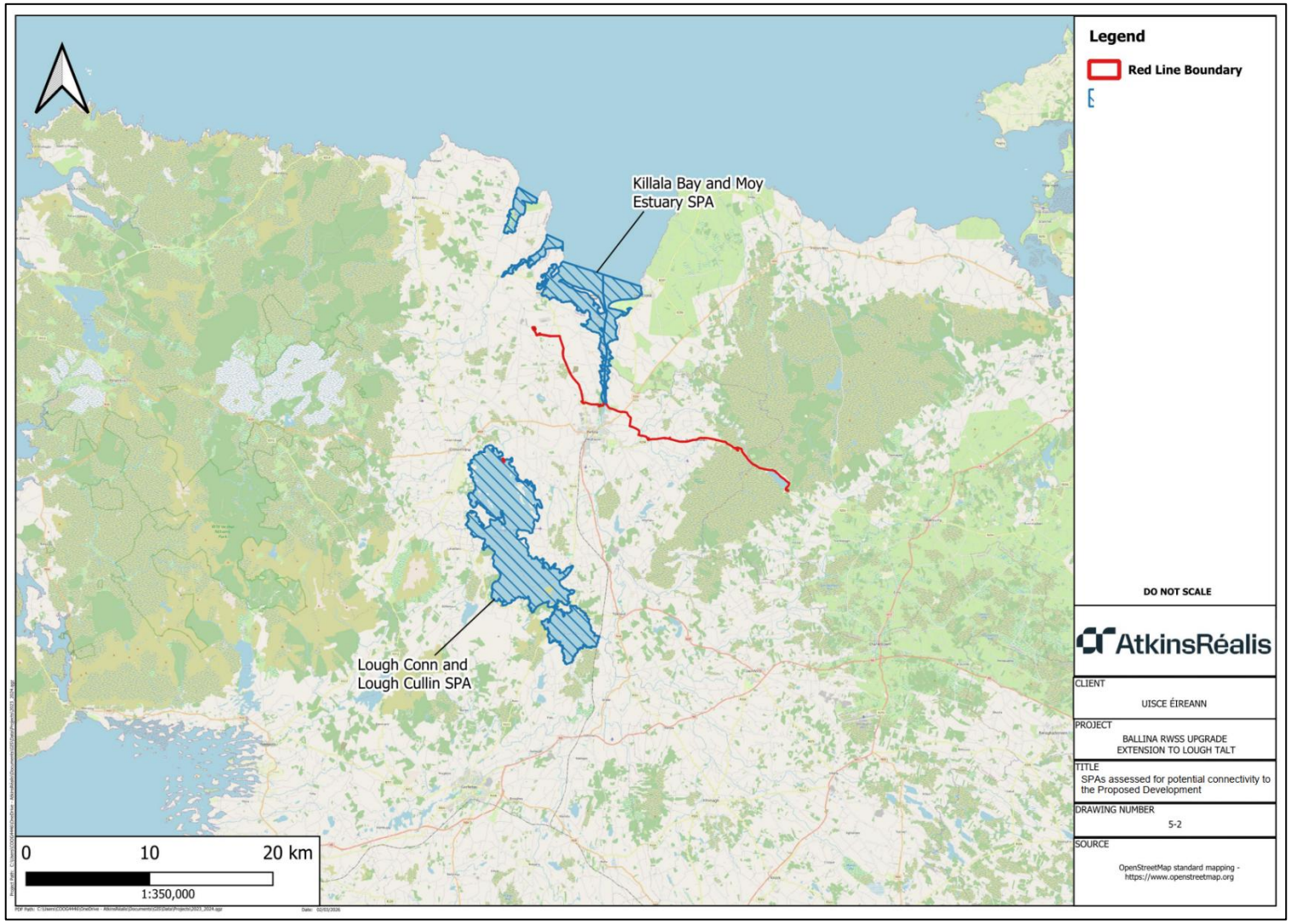



**Figure 5-2 – SPAs assessed for potential connectivity to the Proposed Development**

## 5.2 AA Screening Summary

This section presents the outcome of the Stage 1 Screening for Appropriate Assessment. It identifies the European sites that screen in for further assessment, along with the justification for inclusion, and those that screen out, with justification for exclusion. The determination is based solely on the presence or absence of a source–pathway–receptor relationship, following EC (2021) guidance and the precautionary principle.

### 5.2.1 Screening of European sites

Five European sites are located within, alongside, or have hydrological connectivity to the Proposed Development, namely:-

- River Moy SAC
- Killala Bay/Moy Estuary SAC
- Killala Bay/Moy Estuary SPA
- Lough Conn and Lough Cullin SPA
- Lough Hoe Bog SAC

During the construction phase, the Proposed Development will include upgrades to the existing raw water intake infrastructure at Lough Conn, which is located within both the River Moy SAC and the Lough Conn and Lough Cullin SPA. These works also involve installing a new raw water intake pipe directly within the waterbody. Owing to the extent and location of these in-lake works, the potential for likely significant effects on both the River Moy SAC and the Lough Conn and Lough Cullin SPA cannot be entirely ruled out. In the operational phase, the project will result in increased abstraction from Lough Conn, again within these same European sites, creating the potential for effects on their Conservation Objectives, including those relating to aquatic species and wetland habitats.

Additional interactions occur along the proposed pipeline route. The pipeline crosses the Brusna River within the River Moy SAC and is also in close proximity to the Moy Estuary, which forms part of the Killala Bay/Moy Estuary SAC and SPA. Furthermore, sixteen additional streams crossed by the pipeline outfall into one or more of these designated sites. Given these multiple hydrological connections, the potential for likely significant effects during the construction phase, particularly in the absence of additional protective measures, cannot be excluded.

The proposed pipeline also follows existing roadways for approximately 4km adjacent to Lough Hoe Bog SAC, and a short section of approx. 20 m lies within the SAC boundary. Due to this direct proximity, and in the absence of further safeguards, the possibility of likely significant effects on the SAC cannot be fully discounted.

In contrast, the following seven SACs are screened out: Lough Nabrickkeagh Bog SAC, Ox Mountains Bog SAC, Lackan Saltmarsh and Kilcummin Head SAC, Bellacorick Bog Complex SAC, Glenamoy Bog Complex SAC, Turloughmore (Sligo) SAC, and Newport River SAC.

Each site has been assessed using the Source–Pathway–Receptor model (Table 5-1), and the Proposed Development has been examined in detail with respect to any hydrological, hydrogeological, or ecological linkages, including potential interactions with mobile Qualifying Interest species. This assessment confirms that no direct or indirect pathway exists between the Proposed Development and any of these seven European sites. As there is no mechanism by which the Proposed Development could give rise to likely significant effects on the qualifying interests or Conservation Objectives of these sites, they are screened out of further assessment.

### 5.2.2 AA Screening Conclusion

Given the location, nature and scale of the Proposed Development, and in particular, the works directly within Lough Conn and the number of watercourse crossings, it is considered that, during the construction phase and in the absence of mitigation measures, likely significant effects on River Moy SAC, Killala Bay/Moy Estuary SAC, Lough Hoe Bog SAC, Lough Conn and Lough Cullin SPA, and Killala Bay/Moy Estuary SPA cannot be entirely ruled out. During operation, the increased abstraction from Lough Conn may also result in likely significant effects on aquatic species and fringing wetland habitats. Mitigatory design measures will therefore be required, alongside potential operational phase mitigation, to ensure that adverse effects on the Qualifying Interests and Conservation Objectives of River Moy SAC and the Lough Conn and Lough Cullin SPA are avoided.

Accordingly, in the absence of appropriate mitigation, likely significant effects on River Moy SAC, Killala Bay/Moy Estuary SAC, Lough Hoe Bog SAC, Lough Conn and Lough Cullin SPA, and Killala Bay/Moy Estuary SPA cannot be ruled out, and a Stage 2 Appropriate Assessment is required.

# 6. Natura Impact Statement

This section assesses the River Moy SAC, Lough Conn and Lough Cullin SPA, Killala Bay/Moy Estuary SAC, Killala Bay/Moy Estuary SPA and Lough Hoe Bog SAC in more detail and examines where potentially adverse impacts may arise from the sources of impact identified in Section 5 above. Where potential adverse impacts are identified that may affect the integrity of the SACs and SPAs, avoidance and mitigation measures are proposed to offset these impacts. These are discussed below in following sections.

## 6.1 Impact Assessment – River Moy SAC

This section provides information on River Moy SAC. It assesses this SAC in more detail and examines where potential impacts may arise. Where potential impacts are identified that may affect the integrity of the SAC, avoidance and mitigation measures are proposed to mitigate these impacts (Chapter 7).

### 6.1.1 Site Description

According to the Natura 2000 Standard Data Form[26] this site comprises almost the entire freshwater element of the Moy and its tributaries, including both Lough Conn and Lough Cullin. The river and its various tributaries rise in a number of locations some of which are upland areas dominated by blanket bog and heath. In addition to river and lake habitats, the site contains adjoining habitats of ecological interest such as raised bogs, heath, wet grassland and deciduous woodland. The rivers and lakes support important populations of otter (*Lutra lutra*), white-clawed crayfish (*Austropotamobius pallipes*), brook lamprey (*Lampetra planeri*) and sea lamprey (*Petromyzon marinus*). The Moy system is one of the most important in Ireland for Atlantic salmon (*Salmo salar*) and is an internationally renowned fishery. The lakes support a range of other wintering waterfowl. Lough Conn / Cullin represents one of only 4no. breeding sites in Ireland for common scoter (*Melanitta nigra*). The population, however, has seriously declined in recent years. A range of mammals listed in the Red Data Book occur within the site, including pine marten (*Martes martes*) and Daubenton's bat (*Myotis daubentoni*). At least five Red Data Book plant species occur, including narrow-leaved helleborine (*Cephalanthera longifolia*) and Irish Lady's-tresses (*Spiranthes romanzoffiana*).

### 6.1.2 Conservation Objectives

The Conservation Objectives[27] for River Moy SAC are as follows, as outlined by NPWS:-

- To restore the favourable conservation condition of Active raised bogs in River Moy SAC,
- To maintain the favourable conservation condition of Alkaline fens in River Moy SAC,
- To maintain the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in River Moy SAC,
- To maintain the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in River Moy SAC,
- To maintain the favourable conservation condition of White-clawed Crayfish in River Moy SAC,
- To maintain the favourable conservation condition of Sea Lamprey in River Moy SAC,
- To maintain the favourable conservation condition of Brook Lamprey in River Moy SAC,
- To maintain the favourable conservation condition of Salmon in River Moy SAC, and,

[26] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0002298&release=55

[27] NPWS (2016) Conservation Objectives: River Moy SAC 002298. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

- To maintain the favourable conservation condition of Otter in River Moy SAC.

### 6.1.3 Potential Threats

The threats, pressures and activities with impacts on the SAC[28] are listed below in Table 6-1.

**Table 6-1 – Threats, Pressures and activities with impacts on River Moy SAC**

| Rank | Threats and pressures (type) |
|---|---|
| High | Agricultural intensification |
| High | Diffuse pollution to surface waters due to agricultural and forestry activities |
| High | Forest planting on open ground |
| High | Invasive non-native species |
| High | Use of fertilizers (forestry) |
| Medium | Aerodrome, heliport |
| Medium | Peat extraction |

### 6.1.4 Qualifying Interests

Wherrew Raw Water Intake site is located at Lough Conn which forms part of the SAC. The River Moy SAC is crossed by the Proposed Development in 1 no. location, the Brusna River. An additional 9 no. surface water features crossed by the Proposed Development have hydrological connectivity to River Moy SAC.

Examination of the Qualifying Interests of River Moy SAC potentially subject to impacts from the Proposed Development are outlined in Table 6-2 which includes an analysis and evaluation of the potential for impacts.

**Table 6-2 – Review of qualifying interests of River Moy SAC**

| QI Habitats/Species | Assessment for Potential for Adverse Effects | Potential for Adverse Effects |
|---|---|---|
| Active raised bogs [7110] | NPWS Conservation Objectives documentation (NPWS, 2016) details this terrestrial habitat as occurring in the eastern region of the SAC in upland areas.<br>There is no direct or indirect hydrological connectivity between the Proposed Development and this qualifying interest. In the absence of a complete source–pathway–receptor link, potential impacts on the conservation objectives for this qualifying interest can be excluded at this stage. | No |
| Degraded raised bogs [7120] | NPWS Conservation Objectives documentation (NPWS, 2016) details this terrestrial habitat as occurring in the eastern region of the SAC in upland areas.<br>There is no direct or indirect hydrological connectivity between the Proposed Development and this qualifying interest. In the absence of | No |

[28] https://biodiversity.europa.eu/sites/natura2000/IE0002298

| QI Habitats/Species | Assessment for Potential for Adverse Effects | Potential for Adverse Effects |
|---|---|---|
| | a complete source–pathway–receptor link, potential impacts on the conservation objectives for this qualifying interest can be excluded at this stage. | |
| *Rhynchosporion* vegetation [7150] | NPWS Conservation Objectives documentation (NPWS, 2016) details this terrestrial habitat as occurring in the eastern region of the SAC in upland areas.<br>There is no direct or indirect hydrological connectivity between the Proposed Development and this qualifying interest. In the absence of a complete source–pathway–receptor link, potential impacts on the conservation objectives for this qualifying interest can be excluded at this stage. | No |
| Alkaline fens [7230] | The full extent of this habitat within the SAC is unknown and there is the potential for fen habitat to be on the margins of Lough Conn.<br>As a result of the unknown locations of this habitat, there is potential to impact this habitat should work affect the water quality of surface water features within the Proposed Development site. | Yes |
| Old sessile oak woods [91A0] | This terrestrial habitat is located on the southwestern basin of Lough Conn.<br>Oak woodland habitats are terrestrial in nature and there is no direct or hydrological connectivity from the Proposed Development to this QI habitat.<br>Given the lack of any connectivity, there is not a pathway for potential impacts from the Proposed Development to this qualifying interest. Therefore, potential impacts on the conservation objectives for this qualifying interest can be ruled out at this stage. | No |
| Alluvial forests [91E0] | This habitat is located on the northwestern basin of Lough Conn.<br>There is potential indirect connectivity to this lake fringe habitat from the Proposed Development due to the works taking place within the Wherrew RWI&PS at Lough Conn.<br>The predicted abstraction related change in lake levels is extremely small (approx.11 mm – 31 mm) when set against the natural c. 3,300mm seasonal fluctuation, the Proposed Development will not alter the extent, composition, or functioning of lake fringe habitats, including QI alluvial woodlands, around Lough Conn or Lough Cullin.<br>Whilst the likelihood is considered remote, should work at Wherrew RWI&PS affect the water quality within the lake, there is potential to impact this habitat. | Yes |
| *Austropotamobius pallipes* (White-clawed Crayfish) [1092] | The River Moy SAC supports a population of white-clawed crayfish, a species that is highly sensitive to changes in water quality. Should the Proposed Development give rise to any deterioration in the quality of surface waters within or connected to the Proposed Development, there is the potential impact on this Qualifying Interest. | Yes |
| *Petromyzon marinus* (Sea Lamprey) [1095] | The River Moy SAC supports a population of sea lamprey (migratory passage). | Yes |

| QI Habitats/Species | Assessment for Potential for Adverse Effects | Potential for Adverse Effects |
|---|---|---|
| | Should the Proposed Development give rise to any deterioration in the quality of surface waters within or connected to the Proposed Development, there is the potential for impacts on this Qualifying Interest. | |
| *Lampetra planeri* (Brook Lamprey) [1096] | The River Moy SAC supports a population of brook lamprey (seasonal passage).<br>Should the Proposed Development give rise to any deterioration in the quality of surface waters within or connected to the Proposed Development, there is the potential for impacts on this Qualifying Interest. | Yes |
| *Salmo salar* (Salmon) [1106] | The River Moy SAC supports a population of salmon.<br>Should the Proposed Development give rise to any deterioration in the quality of surface waters within or connected to the Proposed Development, there is the potential for impacts on this Qualifying Interest. | Yes |
| *Lutra lutra* (Otter) [1355] | This species is found in Lough Conn and rivers within this SAC.<br>This species has the potential to be affected should the Proposed Development result in impacts to aquatic prey species (fish) as a result of deterioration in the quality of surface waters within or connected to the Proposed Development, there is the potential for impacts on this Qualifying Interest. | Yes |

## 6.1.5 Identification of Potential Impacts on River Moy SAC

### 6.1.5.1 Qualifying Interest Receptors

As detailed in Table 6-2, the QIs of the SAC which could potentially be impacted are; Alkaline fens, Alluvial forests, White-clawed Crayfish, Sea Lamprey, Brook Lamprey, Salmon and Otter. Whilst the likelihood is considered extremely remote, the QI alluvial woodland habitats and fen habitats can be adversely affected should there be a significant drawn down on the water levels in Lough Conn from water abstraction or should there be severe pollution to Lough Conn or the watercourses forming part of River Moy SAC as a result of the Proposed Development. The QI species can be adversely impacted if there is a deterioration in the water quality of the surface water features which accommodate these species.

### 6.1.5.2 Construction Phase Impacts – Lough Conn

The Proposed Development includes construction works at the existing Wherrew RWI&PS and an increase in water abstraction from Lough Conn when operational. Given the direct physical and hydrological connection between the intake site and the River Moy SAC, a comprehensive assessment of potential impacts on the ecological integrity of Lough Conn is necessary.

During construction, the primary potential impacts relate to proposed works required to upgrade the raw water intake. These works include installation of a new screened intake structure, installation of a fish return system, installation of a new intake pipe in the near shore zone of the lough and finally infilling of the historically dredged intake channel. The aforementioned works will be undertaken whilst raw water abstraction is ongoing at current rates so that local water supply remains unaffected.

Works will begin with the installation of temporary raw intake pipes (polyethylene or similar) connected to the existing pumps in the intake building. From there they will be laid across ground, weighted, secured, and otherwise appropriately protected from accidental damage. The abstracting end will be connected to pontoons in the lake. The pontoons float on the surface, ensuring that the end of the temporary abstraction pipes will be fully submerged at all times and away from the lakebed. This temporary intake mechanism will maintain continuous abstraction throughout the new intake construction period. Following completion of the permanent upgrade works, these temporary pipelines will be removed.

Once the temporary abstraction arrangement is operational, a channel/trench will be excavated alongside the current intake channel to accommodate the fish return bypass pipe, once installed the trench will be backfilled. Following which, the intake area surrounding the existing screens will be isolated using a cofferdam and dewatered to allow safe and dry access for installation of the new intake structure, fish screens, and associated fish return system components. It is currently anticipated that the temporary cofferdam structure may comprise sheet piling over an approximate length of 30 m, or an equivalent solution such as a waterdam or inflatable dam (Portadam[29] or Aquadam[30] or similar), subject to detailed design by the Appointed Contractor. If sheet piling is utilised, installation will be of very short duration (typically 1–2 days) and will employ resonance free vibratory piling techniques to minimise noise and vibration. Additional mitigation measures will include the use of acoustic shrouds, temporary acoustic barriers, restricted working hours and vibration monitoring. All cofferdam installation works will be undertaken during the period July to September, which represents the optimal ecological window for instream works. This timing avoids sensitive periods for aquatic species (e.g. salmonid spawning, egg incubation and early juvenile development) and also avoids the overwintering period for waterbirds associated with Lough Conn and Lough Cullin SPA, thereby minimising the potential for disturbance to Special Conservation Interest species.

The installation of sheet piles within the nearshore zone has the potential to generate short term increases in underwater noise and localised vibration within Lough Conn. These effects could temporarily disturb fish species present within the vicinity of the works, including Qualifying Interest species such as salmon and lamprey. However, given the short duration of piling activities, the use of low impact vibratory methods, and the implementation of noise and vibration attenuation measures, any disturbance will be highly localised, temporary and short term. Fish are expected to move away from the works area during piling activity and return shortly after once works have ceased. No injury, mortality or disruption to key ecological functions (e.g. spawning or migration) is predicted. On this basis, the impact of sheet piling activities on aquatic receptors will be short-term, not significant, and will not affect the ecological integrity of Lough Conn or associated designated sites.

Folling the installation of the cofferdam, all water removed during dewatering will undergo settlement within designated settlement tanks, after which the clarified water will be returned to Lough Conn in a controlled manner. No adverse impacts on the waterbody are anticipated as the over pumped waters will be fully settled prior to discharge. All intake upgrade works will be undertaken in the dry behind the dam and as such there is no potential for any contaminating materials (e.g., cementitious materials, hydrocarbons) to enter the lake waterbody. Once the intake works are completed, the cofferdam will be removed and construction will proceed to installation of the new intake pipeline within the lake.

The new polyethylene intake pipe will be approximately 160 m in length and 1,200mm in diameter. This length is required as water depths near this area of shoreline are shallow during summer months, typically only 2m – 3 m deep at a distance of approx. 160 m from the shore. To ensure that the pipeline sits level on the lakebed, minor grading and levelling of a narrow strip of lakebed, approx. 1.2 m in width, will be required. This work will be carried out mechanically using an excavator positioned on a barge or pontoon.

[29] https://portadam.com/wp-content/uploads/2024/09/MES-0824-097-Portadam-Cofferdam-Brochure.pdf

[30] https://murlac.com/wp-content/uploads/2022/07/MURLAC-Temporary-Dams-Brochure-2022.pdf

The intake pipe will be floated into position using boats or pontoons and flotation devices before being lowered onto the lakebed. Once in place, it will be secured using a fascine mattress (woven mat), which will be ballasted with clean, washed stone to minimise the generation of suspended sediments. Along the near shore section, stone will be placed directly onto the mattress covering the submerged pipe using a long reach excavator working from the shoreline, ensuring that no machinery tracks within the waterbody. For the remaining pipeline length, clean stone will be transported on a modular pontoon or barge, from which a small excavator will place the stone material along the mattress alignment. The pontoon will be repositioned incrementally until stone installation is completed along the full length of the pipeline. Additional localised grading/excavation will also be necessary at the pipe termination point to prepare a flat base area, at the required level, for the primary intake unit at the end of the pipe. As with stone install, the preparation of a flat base area for the intake unit will be done by an excavator on a pontoon/barge. The prefabricated intake unit consists of a section ductile iron pipe and a coarse screen which are mounted inside a precast concrete block approx. 1.75 m x 1.75 m in size. This unit will be lowered into the prepared flat base area and connected to the end of the intake pipe manually by divers.

The new intake system incorporates primary and secondary fish screens, low velocity intake heads and a dedicated fish return system to protect aquatic fauna. The fish screening and fish return system shall be designed in accordance with applicable European and national legislative requirements for the protection of aquatic species, including Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive), Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the Water Framework Directive), and Council Regulation (EC) No. 1100/2007 establishing measures for the recovery of the stock of European eel (the Eel Regulation). In addition, the intake screening and fish protection measures have been developed with reference to Environment Agency (England) guidance[31] on the protection of eels and other fish species at water abstraction intakes. The primary intake screen, with an approximate mesh aperture of 20 mm, prevents the entry of larger fish and other aquatic species into the abstraction system. Any smaller individuals that pass through this initial screen are intercepted by a dedicated fish return system and safely returned to the lake. Downstream of the fish return system, and upstream of the intake chamber, a secondary fine screen with a mesh aperture of ≤ 3 mm prevents the passage of even smaller fish and aquatic organisms into the raw water intake infrastructure. The low intake velocity (≤ 0.10 m/s) further reduces the potential for entrainment, ensuring that juvenile and adult fish, including eels, elvers and lamprey, are either excluded from the abstraction structure or safely returned to the lake without entering the intake chambers. The screening and fish return arrangements are therefore consistent with best practice guidance for the protection of aquatic species at water abstraction intakes. As a result, the proposed abstraction will effectively eliminate the risk of fish entrainment associated with the intake and remove a potential pressure on qualifying interest fish species. This will, in turn, maintain the availability of prey resources for otters and piscivorous waterbirds that utilise the lough. As such, the proposed abstraction represents an ecological improvement over the existing situation. To address biofouling risks, the intake screens are coated with a specialised surface treatment that prevents colonisation by zebra mussels, an invasive species known to cause operational issues in raw water intakes.

Potential pollution risks during intake construction works adjacent to the lake, such as accidental hydrocarbon spills, concrete runoff, or silt laden surface water, are recognised considerations for a designated site of this sensitivity. However, all intake works will be carried out within an isolated, fully enclosed cofferdam, allowing the works area to be kept dry and preventing any interaction with the lake. As a result, there will be no pathway for release of pollutants to the lake and no potential impacts on water quality, aquatic species, waterbirds or otters within the lough.

Only minor excavations of soils are required for the works (fish return pipe), and therefore there will be no potential for significant generation of silt laden runoff from exposed soils or spoil stockpiles. Stone materials used for pipeline bedding and for infilling the existing intake channel will consist solely of clean, washed stone, free of fine sediments. These materials will be stockpiled at an appropriate distance from the shoreline to further eliminate any risk of

[31] *Screening at Intakes and Outfalls: Measures to Protect Eel* (Environment Agency, 2011)

contaminated runoff reaching the lake. Consequently, these construction activities will not give rise to any pollutants capable of affecting lake water quality, sensitive aquatic receptors, waterbirds, otters or wetland habitats.

The grading of the pipeline alignment and the installation of the pipe and stone directly within the lough have the potential to generate localised increases in turbidity, temporary mobilisation of sediments, and short term disturbance to QI fish species; salmon and lamprey if present in the immediate area. Although white-clawed crayfish is also a QI of the SAC, historic records detail it does not occur within Lough Conn and therefore cannot be affected by the Proposed Development works at Lough Conn. Intake pipe works are estimated to take three weeks so any disturbance to fish would be very localised and of short duration. The lake itself is large and capable of assimilating any minor plume of suspended sediment that may be generated from small scale bed grading, laying a polyethylene pipe and placing stone ballast on top. The revised intake design eliminates the need for maintenance dredging within the lake which historically has been necessary. Any sediment release from pipe installation works would be spatially restricted to and diluted within the localised area and would be temporary in nature, with no likely potential to propagate into the wider lake basin or downstream into the River Moy system. Notwithstanding this, mitigation measures to limit the spread suspended solids and sediments within the lough are included in Section 7.

Given that the construction works are located within an already developed section of shoreline, any disturbance to otter is expected to be minimal and temporary. No otter holts or couches are present at or near the Wherrew RWI&PS, and otters in the area are likely habituated to the existing facility and routine human activity. The works will be of relatively short duration and undertaken during daylight hours; as otters are predominantly nocturnal, no significant disturbance to their foraging or movement patterns is anticipated.

#### 6.1.5.3 Operational Phase Impacts – Lough Conn

The potential operational phase impacts on the qualifying interest habitats and species of the River Moy SAC primarily relate to changes in lake levels and flows, water quality processes, the risk of entrainment of aquatic fauna at the intake, and any associated impacts on aquatic ecology or fish passage. Each of these pathways is assessed below in the context of the proposed abstraction increase and the design features of the upgraded intake.

**Changes in Water Levels and Flows**; The accompanying hydrological assessment (Lough Conn Abstraction Assessment Report, Document Ref. 10025936-ATK-XX-XX-RP-ZZ-911500) identifies that the proposed abstraction will result in less than a 5% change in both lake levels and flows within Lough Conn, Lough Cullin and the River Moy. Seasonal lake level fluctuations in these systems naturally span approx. 3300 mm, driven by rainfall, catchment inflows and evaporation. In comparison, the effect of increased abstraction is predicted to reduce lake levels by only approx. 11 mm – 31 mm, representing a very small proportion of the natural regime.

The hydrological assessment also highlights that peak summer evaporation can exceed 200 ML/d, more than five times the proposed abstraction rate, demonstrating that abstraction related effects are negligible relative to natural hydrological variability. As a result, the predicted minor fluctuations in lake level will not alter shoreline extent, waterbody depth, wetted width, marginal or fringe habitats, nor the ecological conditions required by any QI habitats or QI species. In the River Moy, the proportionate change in downstream flows is similarly insignificant and will not produce any discernible hydrological change.

**Changes in Water Quality and Associated Processes**; Changes to water levels or flows can potentially influence water quality parameters such as temperature, dissolved oxygen concentration, and dilution capacity. The hydrological assessment[32] concludes that, under the proposed abstraction regime, both lake and river waterbodies will remain in compliance with WFD “Good” or “High” status for all relevant parameters. Consequently, no changes in

[32] Lough Conn Abstraction Assessment Report, Document Ref. 10025936-ATK-XX-XX-RP-ZZ-911500

water quality processes of ecological relevance are expected, and no deterioration in conditions required to support QI species, including salmon, lamprey, and otter, will occur.

**Entrainment of Aquatic Species at the Intake**; The existing abstraction at Wherrew uses only a coarse screen at the intake which allows the potential ingress of fish and other aquatic organisms into the pump station. Under current conditions, this presents a potential pressure on salmonids, lamprey, and other prey species relied upon by otter and certain SPA bird species. The upgraded intake design substantially improves the current situation. The new intake system incorporates primary and secondary fish screens, low velocity intake heads, and a dedicated fish return system to protect aquatic fauna. The primary screen (approx. 20 mm mesh aperture) prevents the entry of larger fish and other aquatic species into the abstraction system, while any smaller individuals that pass this screen are intercepted by a dedicated fish return system and safely returned to the lake. A secondary fine screen (2 mm - 3 mm mesh aperture), located downstream of the fish return system and upstream of the intake chamber, prevents the passage of even smaller fish and aquatic organisms into the raw water intake. As a result, juvenile and adult fish, including elvers and lamprey, are either excluded from the abstraction structure or safely returned to the lake without entering the treatment system. These measures will eliminate entrainment risk and therefore remove the existing pressure on QI fish species and otters and waterbirds that rely on them. As such, the proposed abstraction represents an ecological improvement compared with current conditions.

**Effects on Waterbody Habitat and Fringe/Marginal Zones**; Because the predicted abstraction related change in lake levels is extremely small (approx. 11 mm – 31 mm) when set against the natural approx. 3,300 mm seasonal fluctuation, the Proposed Development will not alter the extent, composition, or functioning of lake fringe habitats, including QI fens and alluvial woodlands, around Lough Conn or Lough Cullin. Wetland margins, shallow bays, littoral vegetation zones, and shoreline features will remain unaffected. Accordingly, no QI species reliant on these habitats, such as otter, will experience habitat loss or degradation.

**Effects on Aquatic Community Structure**; A reduction in river flows can, in theory, lead to a loss of taxa dependent on higher velocity habitats. However, given that hydrological modelling shows no perceptible change in lake levels, no meaningful change in river flows downstream of Foxford, and no reduction in WFD status, changes to habitat characteristics are not anticipated. The aquatic communities of Lough Conn, Lough Cullin and the River Moy are therefore expected to continue functioning within their natural ecological regimes.

**Potential Restrictions on Fish Passage or Migration**; Changes in river flow or water levels could affect the porosity or effectiveness of in-stream barriers and fish passes. Available information indicates the presence of one major barrier, the Ballina Salmon Weir, and two minor structures between Lough Cullin and the River Moy (including an old eel weir). As the hydrological assessment shows no discernible reduction in flows within the River Moy, the operation of these structures will not be altered. Fish passage conditions, migration cues and barrier passability will remain unchanged, and no fragmentation of habitats or impediment to migratory salmon or lamprey is anticipated.

**Additional Operational Considerations**; Under the upgraded abstraction regime, daily abstraction will increase from approximately 13,400 m³/day to 26,900 m³/day (a net increase of 12,950 m³/day), with potential future demand up to 38,120 m³/day. Even at maximum demand, abstraction represents a minor component of total lake turnover in a large (4,704 ha), deep (max depth 37.9 m), hydrologically robust system with significant inflows. Consequently, the predicted abstraction is not expected to influence nearshore hydrodynamics or have any ecological consequences.

Fish migration, spawning, and recruitment processes will also remain unaffected. Lough Conn supports stable populations of salmon, brown trout, eel, perch, roach and landlocked lamprey, all of which will experience enhanced protection as a result of the new screening system. Migratory sea lamprey and brook lamprey on seasonal passage will continue to pass through the lake enroute to upstream spawning grounds, and no changes to these ecological pathways are expected.

The invasive zebra mussel, already present at the intake site, poses operational challenges through biofouling. The proposed intake includes anti-fouling coatings that prevent zebra mussel settlement, eliminating infrastructure

blockages and reducing the need for intrusive maintenance. Since the species is already established within the lake, the new intake will not alter its distribution or create any new ecological risk.

In summary, the proposed abstraction will result in only minimal changes to lake levels and negligible changes to flows in the River Moy. Water quality will remain within WFD "Good" to "High" status, fringe and marginal habitats will not be altered, and no hydrological or ecological pathways will give rise to adverse effects on QI or SCI species or habitats. The new intake design provides a substantial improvement for aquatic fauna by significantly reducing entrainment risk through the incorporation of fish screes and a fish return system, delivering an ecological benefit compared with the existing intake.

No impacts on fish passage, migration, aquatic community structure, wetland habitats, ecological processes are predicted. Given the absence of any adverse effects and the overall improvement in protection of aquatic species, it can be concluded that when operational, the Proposed Development will not result in impacts on the qualifying interest habitats or species of the River Moy SAC in view of their conservation objectives. The inclusion of the fish screens and fish return system can result in a significant positive effect over the long term within Lough Conn.

#### 6.1.5.4 Brusna River Crossing

No QI habitats of the River Moy SAC, such as alluvial woodland, old oak woodland, alkaline fen, or lowland hay meadows, are present at or near the proposed Brusna River crossing location. Accordingly, the works in this area will not affect any QI habitats. The surrounding land is dominated by improved agricultural grassland with small sections of hedgerow and treeline. One short section (*c*. 5m) of hawthorn hedgerow within the SAC boundary will be removed to facilitate construction; this will be reinstated on a like for like basis following completion of the works (other hedgerows intersected in this area are outside of the SAC). All disturbed agricultural land will also be fully reinstated.

The use of HDD allows the pipeline to pass beneath the river at a depth of approx. 1.5 m – 2 m, meaning the river channel, banks, and riparian zone will remain entirely undisturbed. As no instream works are required at any stage, there will be no loss, alteration, or fragmentation of aquatic or riparian habitats within the SAC.

In the absence of mitigation, construction activities in proximity to the river could pose risks such as sediment mobilisation, hydrocarbon or chemical spills, and the inadvertent release of drilling fluid (frac out) into the aquatic environment. These events have the potential to impact sensitive SAC species, including salmonid eggs and fry, lamprey ammocoetes, and macroinvertebrate communities that rely on clean, well oxygenated substrates. HDD has been specifically selected to be 1.5 m – 2 m below the river bed to minimise such risks by avoiding riverbed disturbance and ensuring that drilling operations remain isolated from surface waters.

Standard bentonite drilling muds commonly used in HDD are known to be harmful to aquatic organisms due to their potential to clog fish gills if released into watercourses. To eliminate this risk, only non toxic drilling fluids (e.g. Cebo Hybrid-Gel[33] or similar) will be used for the Brusna River crossing. Although HDD launch and reception pits will be positioned at least 20 m from the riverbanks, there remains a residual potential for silt laden runoff or accidental hydrocarbon releases, particularly during periods of heavy rainfall, to reach the river and temporarily affect water quality. Measures to prevent deterioration of water quality in the Brusna River are set out in Section 7.

As no instream activity will occur, there will be no alteration of flow patterns, or removal of substrate. While HDD operations may generate localised subsurface vibration, these effects are expected to be negligible and not significant due to the separation of the bore path (1.5 m – 2 m below river bed) from the aquatic environment and the low vibration levels typically associated with HDD works. Consequently, any salmonid spawning habitat and lamprey nursery areas will remain unaffected, and fish passage, feeding behaviour, and life cycle processes will not be impacted. The HDD technique also avoids interaction with riparian habitat, thereby preventing disturbance to any otter commuting routes

[33] https://www.cebo.com/our-solutions/construction/horizontal-directional-drilling/

or resting sites. Given the absence of crayfish records or site survey evidence of crayfish at this location and the lack of direct instream works, no effects on this Annex II species are anticipated.

The HDD method also prevents the need for vegetation clearance along the riverbanks, avoiding disturbance to nesting birds and preserving riparian cover. All works will occur at a substantial distance from the watercourse, and no night time construction will take place, further reducing the potential for disturbance to nocturnal species such as otter.

#### 6.1.5.5 Other Watercourse Crossings

The proposed development includes a total of thirty surface water feature crossings, comprising eighteen EPA identified streams/rivers along the pipeline route. Of these watercourses nine. streams flow into River Moy SAC; one stream flows into the River Moy in Ballina town and eight of streams flow into the River Brusna which is within the SAC. The Brusna River crossing is already discussed separately above. No field drains crossed by the pipeline connect to River Moy SAC.

**Construction Phase**

The Illanamuck Stream located to the east of Ballina flows directly into River Moy and is culverted within in the R314 roadway at the proposed crossing point in Culleens village. At this location the new pipeline is proposed to be laid within the roadway under the existing road culvert (pipe) and as such there will be no interaction with any open channel watercourse or any riparian habitats at this locations.

The remaining eight. streams are all tributaries of the Brusna River. Trenchless techniques (pipe-jacking) are proposed to be used for the eight streams being crossed; Fiddaun Stream, Bunnyconnellan West Stream, Srafaungal Stream (two crossing locations), Glenree Stream and three unnamed streams, and as such no instream works will occur at these crossings. Pipe jacking launch and reception pits will be set back a minimum of 10 m from the these streams so there will be no direct interaction with any stream banks, in the case of the second crossing of the Srafaungal Stream pits will be set back at a greater distance to avoid loss of, or impacts to, sensitive habitats such as trees and wet grasslands. As a result, there will be no disturbance to the stream beds, banks, or riparian vegetation at these locations. These trenchless methods avoid physical alteration to instream habitats and prevent any mortality of aquatic fauna.

As detailed for the Brusna River crossing, construction machinery operating in proximity to watercourses, even with a set back distance for launch/reception pits, introduces the potential for accidental release of sediments, hydrocarbons or other contaminants. Small streams with limited dilution capacity, such as several narrow streams crossed by the pipeline, would be particularly vulnerable to short term pollution events. Downstream hydrological connectivity means that any spill, even in a minor tributary, has the potential to reach high value designated waters within River Moy SAC. Measures to prevent deterioration of water quality in the streams (and field drains) crossed by the pipeline are set out in Chapter 7.

Potential adverse effects on surface water quality and on the downstream River Moy SAC could arise in the absence of appropriate mitigation. Mitigation measures required to prevent deterioration in water quality and avoid impacts on downstream sensitive receptors are described in Section 7.

**Operational Phase**

As noted previously, the proposed pipeline will be buried with no emissions during the operational phase. The usage of the potable water trunk main will have no effect on River Moy SAC.

## 6.2 Impact Assessment – Lough Conn and Lough Cullin SPA

This section provides information on Lough Conn and Lough Cullin SPA. It assesses this SPA in more detail and examines where impacts may arise. Where potential impacts are identified that may affect the integrity of the SPA, avoidance and mitigation measures are proposed to mitigate these effects (Chapter 7).

### 6.2.1 Site Description

According to the Natura 2000 Standard Data Form[34] the main inflowing rivers to Lough Conn are the Deel, the Addergoole and the Castlehill while the main outflowing river from Lough Cullin is the River Moy. The lakes have a number of small islands. Fringing swamp vegetation occurs in some sheltered areas. Both Lough Conn and Lough Cullin are part of an important salmonid fishery. Lough Conn and Lough Cullin is one of only four breeding sites in the country for common scoter (*Melanitta nigra*). Lough Conn and Lough Cullin is also of importance for wintering waterfowl, with a nationally important population of tufted duck (*Aythya fuligula*). Lough Conn is also one of the sites utilised by a population of Greenland white-fronted goose (*Anser albifrons flavirostris*). The geese feed mainly on Annagh Island and at a shoreline site near Cloonaghmore Point.

### 6.2.2 Conservation Objectives

The Conservation Objectives for Lough Conn and Lough Cullin SPA are as follows, as outlined by NPWS:-

- To maintain the Favourable conservation condition of Tufted Duck in Lough Conn and Lough Cullin SPA,
- To restore the Favourable conservation condition of Common Scoter in Lough Conn and Lough Cullin SPA,
- To maintain the Favourable conservation condition of Common Gull in Lough Conn and Lough Cullin SPA,
- To restore the Favourable conservation condition of Greenland White-fronted Goose in Lough Conn and Lough Cullin SPA,
- To maintain the Favourable conservation condition of Wetland habitats in Lough Conn and Lough Cullin SPA as a resource for the regularly-occurring migratory waterbirds that utilise these areas.

### 6.2.3 Potential Threats

The threats, pressures and activities with impacts on the SPA[35] are listed below in Table 6-3.

**Table 6-3 - Threats, Pressures and Activities with impacts on Lough Conn and Lough Cullin SPA.**

| Rank | Threats and pressures (type) |
|---|---|
| High | Leisure fishing |
| Medium | Fertilisation |
| Medium | Sylviculture, forestry |
| Low | Invasive non-native species |

[34] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0004228&release=62

[35] https://biodiversity.europa.eu/sites/natura2000/IE0004228

## 6.2.4 Qualifying Interests

There is direct connectivity between the Proposed Development and the Lough Conn and Lough Cullin SPA. Construction activities are proposed at the Wherrew RWI&PS, which lies within the SPA, and the Proposed Development also includes the installation of water abstraction pipes within the Lough Conn waterbody. During the operational phase, the Proposed Development will result in ongoing water abstraction from Lough Conn at Wherrew RWI&PS.

As works will take place directly within the waterbody of Lough Conn and will involve an increase in water abstraction from the lough, there is potential for impacts on the four SCI waterbird species, namely Tufted Duck, Common Scoter, Common Gull and Greenland White-fronted Goose. In addition, the fringe wetland habitats that support these species could potentially be affected as a result of increased water abstraction.

## 6.2.5 Identification of Potential Impacts on Lough Conn and Lough Cullin SPA

### 6.2.5.1 Construction Phase Impacts

Construction phase works activities within Lough Conn are as previously outlined in depth in Section 6.1.5.2. The construction phase will comprise shoreline works at the Wherrew RWI&PS and the installation of new raw water abstraction infrastructure within Lough Conn, including a new intake pipe and upgrades to the existing intake channel. All in-lake works will be confined to a small, localised area along the northern shoreline. Habitat surveys and the project specific breeding bird survey confirmed that this area supports only common, widespread generalist species, with no evidence of significant shoreline or open water breeding bird activity.

Breeding populations associated with the SPA, including Common Scoter and gull species, are primarily located within shoreline wetland areas and island habitats elsewhere on the lake and were not recorded breeding within or adjacent to the Proposed Development site. The construction footprint is restricted to an already modified section of shoreline and does not extend into undisturbed nesting habitat.

In-lake pipeline installation may result in short term noise and increased human presence; however, any associated disturbance to SCI breeding bird species is expected to be highly localised and temporary, as in-lake works will be completed over an approximate three week period. Given the absence of nesting habitat for SPA qualifying species within the works area, the short duration and limited spatial extent of construction activities, and the availability of extensive undisturbed shoreline habitat around Lough Conn, no significant impacts on nesting SCI birds are anticipated.

In-lake works for the laying of the intake pipe will be undertaken during spring summer months (April – September) to negate any potential disturbance to overwintering Special Conservation Interest species; Tufted duck and Greenland White-fronted geese associated with the SPA.

Overall, potential construction phase impacts on SCI breeding bird species are limited to small scale, temporary disturbance and short term displacement. In light of the absence of high value breeding habitat, the lack of qualifying interest bird species recorded within the works area, and the very limited extent of shoreline modification (approx. 20 m), no significant impacts on SCI breeding birds or their nesting habitats are predicted. No impacts on the prey of SCI bird species, including fish populations, are anticipated given the short duration and localised nature of the works and, as such, no impacts on SCI bird foraging behaviour are expected.

#### 6.2.5.2 Operational Phase Impacts

During the operational phase, the Proposed Development will result in abstraction of water from Lough Conn at the Wherrew RWI&PS. As detailed in Section 6.1.5.3, the increase in water abstraction will not result in changes to the extent, composition or functioning of lake fringe habitats that support SCI bird species.

Breeding and foraging habitats for SPA qualifying species, including Common Scoter, gull species, Tufted duck and Greenland White-fronted Goose, will therefore not be affected during operation. No effects on fish populations or other prey resources are predicted, and no impacts on the distribution, behaviour or foraging patterns of SCI bird species are anticipated. On this basis, no significant operational phase impacts on SCI birds or their supporting habitats are predicted.

# 6.3 Impact Assessment – Killala Bay/Moy Estuary SAC

This section provides information on Killala Bay/Moy Estuary SAC. It assesses this SAC in more detail and examines where potential impacts may arise. Where potential impacts are identified that may affect the integrity of the SAC, avoidance and mitigation measures are proposed to mitigate these impacts (Chapter 77).

## 6.3.1 Site Description

According to the Natura 2000 Standard Data Form[36] this large site comprises the inner part of Killala Bay, including the estuary of the River Moy from downstream of Ballina. Sand dunes systems, estuaries and intertidal areas are the main habitats of the site. Bartragh Island, a sand bar on which a dune system has developed, stretches across most of the outer part of the site. A further dune system protrudes westwards from Enniscrone, while more dunes occur at the Ross peninsula in the north-west of the site. Other habitats present include salt marshes, dry grassland, reedbeds and scrub. Some humid dune slacks also occur, and there are good and fairly extensive examples of shifting dunes with marram, embryonic shifting dunes and annual vegetation of driftlines. Salt marshes are well represented, with both Atlantic salt meadows and *Salicornia* types present. The site is important for the occurrence of the Annex II mollusc narrow-mouther whorl snail (*Vertigo angustior*), which occurs in marsh habitat. An excellent diversity of waterfowl winter at site, including two Annex I Bird Directive species golden plover (*Pluvialis apricaria*) and bar-tailed godwit (*Limosa lapponica*) and seven other species winter in nationally important numbers, and in some winters internationally important concentrations. Two Red Data plant species are known from site. The site supports an important population of harbour seal (*Phoca vitulina*) and both adult and juvenile sea lamprey (*Petromyzon marinus*).

## 6.3.2 Conservation Objectives

The Conservation Objectives[37] for Killala Bay/Moy Estuary SAC are as follows, as outlined by NPWS:-

- To maintain the favourable conservation condition of Narrow-mouthed Whorl Snail in Killala Bay/Moy Estuary SAC,
- To maintain the favourable conservation condition of Sea Lamprey in Killala Bay/Moy Estuary SAC,
- To maintain the favourable conservation condition of Estuaries in Killala Bay/Moy Estuary SAC,
- To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Killala Bay/Moy Estuary SAC,

[36] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0000458&release=62

[37] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

- To maintain the favourable conservation condition of Annual vegetation of drift lines in Killala Bay/Moy Estuary SAC,
- To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in Killala Bay/Moy Estuary SAC,
- To maintain the favourable conservation condition of Atlantic salt meadows (*Glauco- Puccinellietalia*) in Killala Bay/Moy Estuary SAC,
- To maintain the favourable conservation condition of Harbour Seal in Killala Bay/Moy Estuary SAC,
- To restore the favourable conservation condition of Embryonic shifting dunes in Killala Bay/Moy Estuary SAC,
- To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) in Killala Bay/Moy Estuary SAC,
- To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Killala Bay/Moy Estuary SAC, and,
- To maintain the favourable conservation condition of Humid dune slacks in Killala Bay/Moy Estuary SAC.

### 6.3.3 Potential Threats

The threats, pressures and activities with impacts on the SAC[38] are listed below in Table 6-4.

**Table 6-4 – Threats, Pressures and Activities with impacts on Killala Bay/Moy Estuary SAC**

| Rank | Threats and pressures (type) |
|---|---|
| High | Camping and caravans |
| High | Diffuse pollution to surface waters due to household sewage and waste waters |
| High | Skiing complex |
| High | Urbanised areas, human habitation |
| High | Walking, horseriding and non-motorised vehicles |
| Medium | Flooding and rising precipitations |
| Low | Leisure fishing |

### 6.3.4 Qualifying Interests

Works are in close proximity (approx. 15 m – 20 m) to Killala Bay/Moy Estuary SAC where the pipeline connects to existing infrastructure (mains pipes) already under the estuary. It is noted that the existing pipeline under the estuary is outside of the red line boundary of the Proposed Development. In addition six surface water features crossed by the proposed flow into this SAC providing hydrological connectivity. Examination of the QIs of Killala Bay/Moy Estuary SAC (NPWS, 2012) potentially subject to adverse effects from the Proposed Development are in Table 6-5 which includes an analysis and evaluation of the potential for impacts.

[38] https://biodiversity.europa.eu/sites/natura2000/IE0000458

**Table 6-5 – Review of qualifying interests of Killala Bay/Moy Estuary SAC**

| QI Habitats/Species | Assessment for Potential for Adverse Effects | Potential for Adverse Effects |
|---|---|---|
| Estuaries [1130] | This habitat occupies the southern portion of the SAC within the River Moy.<br>Works are in close proximity (approx. 15 m) to this habitat where the pipeline ties an existing trunk main. The pipeline crosses surface water features that discharge into the SAC, creating both direct and indirect connectivity.<br>Consequently, construction activities near the estuary and/or any deterioration in surface water quality caused by the Proposed Development could impact this habitat. | Yes |
| Mudflats and sandflats [1140] | This habitat occupies the entirety of the SAC along the banks.<br>Works are in close proximity (approx. 15 m) to this habitat where the pipeline ties an existing trunk main. The pipeline crosses surface water features that discharge into the SAC, creating both direct and indirect connectivity.<br>Consequently, construction activities near the estuary and/or any deterioration in surface water quality caused by the Proposed Development could impact this habitat. | Yes |
| Annual vegetation of drift lines [1210] | This habitat has been recorded at Bartragh Island within the SAC.<br>This habitat located approx. 9 km from the Moy Estuary crossing point and this habitat is terrestrial in nature, as such there is no direct or hydrological connectivity to this shoreline habitat from the Proposed Development.<br>Therefore, potential impacts on its conservation objectives can be ruled out at this stage. | No |
| *Salicornia* mud and sand [1310] | This habitat occurs offshore in Killala Bay approx. 9 km from the Moy Estuary crossing point.<br>There is only weak hydrological connectivity between the Proposed Development site and this habitat via estuarine waters. Although the likelihood of any impact is considered extremely remote, the presence of a minimal hydrological pathway requires the habitat is included in the assessment on a precautionary basis. | Yes |
| Atlantic salt meadows [1330] | This habitat occurs within the mouth of the Moy Estuary approx. 3 km from the Moy Estuary crossing point.<br>There is only weak hydrological connectivity between the Proposed Development site and this habitat via estuarine waters. Although the likelihood of any impact is considered extremely remote, the presence of a minimal hydrological pathway requires the habitat is included in the assessment on a precautionary basis. | Yes |
| Embryonic shifting dunes [2110] | This habitat has been recorded at Bartragh Island within the SAC.<br>This habitat is terrestrial in nature and as such there is no potential hydrological connectivity through which potential impacts could occur. | No |

| QI Habitats/Species | Assessment for Potential for Adverse Effects | Potential for Adverse Effects |
|---|---|---|
| | Therefore, impacts on its conservation objectives can be ruled out at this stage. | |
| Shifting dunes (white dunes) [2120] | This habitat has been recorded at Bartragh Island within the SAC.<br>This habitat is terrestrial in nature and as such there is no potential hydrological connectivity through which potential impacts could occur.<br>Therefore, impacts on its conservation objectives can be ruled out at this stage. | No |
| Fixed coastal dunes (grey dunes) [2130] | This habitat has been recorded at Bartragh Island within the SAC.<br>This habitat is terrestrial in nature and as such there is no potential hydrological connectivity through which potential impacts could occur.<br>Therefore, impacts on its conservation objectives can be ruled out at this stage. | No |
| Humid dune slacks [2190] | This habitat has been recorded at Bartragh Island within the SAC.<br>This habitat is terrestrial in nature and as such there is no potential hydrological connectivity through which potential impacts could occur.<br>Therefore, impacts on its conservation objectives can be ruled out at this stage. | No |
| *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] | This snail species occurs in optimal habitat of wet grassland and marsh along the Newtown River on the east of this SAC approx. 4 km north of the Moy Estuary crossing point.<br>There is no connectivity from the Proposed Development to snail habitat; wet grassland and marsh habitat along the Newtown River.<br>Therefore, impacts on its conservation objectives can be ruled out at this stage. | No |
| *Petromyzon marinus* (Sea Lamprey) [1095] | Killala Bay/Moy Estuary SAC supports an important population of sea lamprey.<br>This species has the potential to be impacted should the Proposed Development result in a deterioration of water quality within the Moy Estuary. | Yes |
| *Phoca vitulina* (Harbour Seal) [1365] | Killala Bay/Moy Estuary SAC supports a population of harbour seal.<br>Whilst it is considered highly unlikely, following a precautionary approach, this species has the potential to be impacted should the Proposed Development result in a very significant deterioration of water quality within the Moy Estuary. | Yes |

## 6.3.5 Identification of Potential Impacts on Killala Bay/Moy Estuary SAC

### 6.3.5.1 Qualifying Interest Receptors

The QIs of the SAC which could potentially be affected are; estuaries, mudflats and sandflats, Sea lamprey and Harbour seal. The Proposed Development works are in close proximity to estuarine and mudflat and sandflat habitats

and the proposed new trunk main also crosses surface water features that discharge into the SAC. Any deterioration in water quality resulting from the Proposed Development could adversely affect these qualifying interest habitats. QI species could also be impacted by any deterioration in water quality, which supports sea lamprey and harbor seal.

#### 6.3.5.2 Construction Phase Impacts

As the proposed development will utilise an existing sub estuarine trunk main, no excavation, trenching, pipe installation or bed disturbance will occur within the estuary, meaning there will be no loss of intertidal or sub tidal habitat, no alteration of estuarine geomorphology, and no changes to hydrology or sedimentation patterns. As a result, the Proposed Development completely avoids potential ecological impacts typically associated with new estuarine pipeline installations.

The reuse of the existing trunk main eliminates the need for any works in the estuarine environment itself. Construction activities will instead be confined on the west side of the estuary to an open glade on woodland edge within Belleek Woods and on the east side of the estuary to an area of hardstanding surfaces on Quay Road, where the trunk main tie-ins will occur. The pipeline works leading up to the western tie in are directly within the woods are well buffered from the estuary by dense woodland. On the eastern side of the estuary, the tie-in location is separated from the estuary by roadside walls, hardstanding surfaces and a building followed by a approx. 25 m vegetative buffer in the form of willow scrub and grasslands. The only potential pathway for water quality impacts would arise from accidental runoff or spills during construction works on the landward sides. Given the separation distance and the interception provided by bankside vegetation, the likelihood of pollutants reaching the estuary is considered extremely low. In the absence of mitigation measures, the limited amount of pollutants that could reach the estuary could represent only a slight adverse, temporary impact. Standard construction phase controls, including spill prevention, designated refuelling zones, and silt management measures, are considered sufficient to prevent any deterioration in water quality and are detailed in Section 7 below.

Because the existing trunk main will be used, there will be no noise, vibration, or physical disturbance within estuarine waters. Migration corridors for salmonids and lamprey will remain unobstructed, and no alteration of estuarine flows will occur. The diverse fish community of the estuary, including QI species, will therefore remain unaffected.

The proposed works at the River Moy Estuary will take place over a short duration, the use of the existing trunk main ensures that all construction activity is of small scale and remains confined to the terrestrial tie in locations rather than within the estuary itself. As such, no significant disturbance impacts to any SAC QI species are anticipated from the tie-in works.

#### 6.3.5.3 Operational Phase Impacts

Once installed, the pipeline will be buried, with no emissions or operational discharges. There will be no requirement for maintenance works within the estuarine area, and no pathways for ongoing impacts to the hydrology, water quality, or ecological function of the estuary. As such, no operational impacts on SAC habitats or species will occur.

## 6.4 Impact Assessment – Killala Bay/Moy Estuary SPA

This section provides information on Killala Bay/Moy Estuary SPA. It assesses this SPA in more detail and examines where potential impacts may arise. Where potential impacts are identified that may affect the integrity of the SPA, avoidance and mitigation measures are proposed to mitigate these impacts (Chapter 7).

### 6.4.1 Site Description

According to the Natura 2000 Standard Data Form[39] this large site comprises the inner, estuarine part of Killala Bay, at the mouth of the River Moy. The site is well-sheltered by a sandy island, Bartragh Island, that extends across much of the outer part, and by a sandy peninsula which extends from Enniscrone on the eastern side. Extensive intertidal sand and mud flats are exposed at low tide. Salt marshes skirt part of the intertidal flats. It supports an excellent diversity of wintering waterfowl and is one of the most important sites in the region. Six of the species have populations of national importance: bar-tailed godwit (*Limosa lapponica*), ringed plover (*Charadrius hiaticula*), grey plover (*Pluvialis squatarola*), sanderling (*Calidris alba*), red knot (*Calidris canutus*) and dunlin (*Calidris alpina*). There is a regular population of light-bellied brent goose (*Branta bernicla hrota*) which in some winters exceeds the threshold for international importance. The Red Data Book species, opposite-leaved pondweed (*Groenlandia densa*), occurs in the site.

### 6.4.2 Conservation Objectives

The Conservation Objectives for Killala Bay/Moy Estuary SPA are as follows, as outlined by NPWS:-

- To maintain the favourable conservation condition of Ringed Plover in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Golden Plover in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Grey Plover in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Sanderling in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Dunlin in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Bar-tailed Godwit in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Curlew in Killala Bay/Moy Estuary SPA,
- To maintain the favourable conservation condition of Redshank in Killala Bay/Moy Estuary SPA, and,
- To maintain the favourable conservation condition of wetland habitat in Killala Bay/Moy Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

### 6.4.3 Potential Threats

The threats, pressures and activities with impacts on the SPA[40] are listed below in Table 6-6.

**Table 6-6 – Threats, Pressures and Activities with impacts on Killala Bay/Moy Estuary SPA**

| Rank | Threats and pressures (type) |
|---|---|
| Medium | Fertilisation |
| Medium | Walking, horseriding and non-motorised vehicles |
| Medium | Urbanised areas, human habitation |
| Medium | Leisure fishing |

### 6.4.4 Qualifying Interests

The width of the estuary near the works areas is relatively narrow (approx. 170 m) and, as a result, the extent of wetland and intertidal habitats adjacent to the Proposed Development site is limited. These habitats provide only a

[39] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0004036&release=62

[40] https://biodiversity.europa.eu/sites/natura2000/IE0004036

limited resource for SCI waterbird species associated with the SPA. The more extensive areas of wetland habitats that support significant numbers of SCI waterbirds are located approx. 5 km – 6 km to the north, within the broad intertidal areas of Killala Bay.

Accordingly, it is unlikely that significant numbers of SCI waterbirds occur within the estuary adjacent to the tie-in locations, and the availability of suitable foraging or roosting habitat in this area is very limited. Nevertheless, small areas of qualifying interest intertidal habitat are present along this stretch of the estuary and may be used opportunistically by wintering waterbirds. As such, all SCI species that may utilise this section of the estuary could potentially be subject to disturbance impacts, albeit for a short period and involving small numbers of individuals.

### 6.4.5 Identification of Potential Impacts on Killala Bay/Moy Estuary SPA

#### 6.4.5.1 Construction Phase Impacts

The proposed works to tie-in to the existing sub estuarine trunk main will take place over a short duration (approx. 3 - 4 days), the use of the existing sub estuarine trunk main ensures that all construction activity is of small scale and remains confined to the terrestrial tie-in locations rather than within the estuary itself. Given the very small scale nature of the works at the tie-in locations, i.e. only small scale excavations, there will be very limited potential for any contaminated runoff to impact intertidal or wetlands habitats along the estuary shoreline. Notwithstanding this, following a precautionary approach, mitigation measures, to ensure there is no potential for construction related contaminated runoff to estuarine waters, are detailed in Chapter 7.

Although the two tie-in locations on either side of the estuary are not fully screened by trees, they are situated along a relatively narrow section of the estuary where waterbirds are less likely to congregate. The majority of SCI species are associated with the more extensive intertidal flats and wider mudflat and sandflat habitats located to the north in Killala Bay, where feeding and roosting opportunities are considerably greater. In addition, this section of the estuary is already subject to regular human activity associated with Belleek forest walks and the quay on the eastern bank. As such, bird species utilising this areas are likely to be accustomed to a degree of existing disturbance. Consequently, despite some visibility between the tie-in works and the estuary, the small scale and brief duration of construction, together with the low numbers of birds likely to use this narrow stretch of the SPA and the existing baseline level of disturbance, means that disturbance to estuarine bird species is expected to be negligible.

#### 6.4.5.2 Operational Phase Impacts

Once installed, the pipeline will be buried, with no emissions or operational discharges. There will be no requirement for maintenance works within the estuarine area, and no pathways for any impacts to the hydrology, water quality, or ecological function of the estuary. As such, no operational impacts on SPA habitats or species will occur.

## 6.5 Impact Assessment - Lough Hoe Bog SAC

This section provides information on Lough Hoe Bog SAC. It assesses this SAC in more detail and examines where potential impacts may arise. Where potential impacts are identified that may affect the integrity of the SAC, avoidance and mitigation measures are proposed to mitigate these impacts (Section 7).

## 6.5.1 Site Description

According to the Natura 2000 Standard Data Form[41] this is an area of undulating blanket bog and heath-covered rocky ridges on a lake-studded plateau in the Ox Mountains. Lough Talt, the largest lake on the site. Some 50% of the site supports wet and dry heath, while blanket bog covers most of the rest of the site. The blanket bog on the site comprises a relatively intact example of the montane type. Lough Talt and other areas of standing water on the site are good examples of unpolluted, acidic oligotrophic lakes. Lough Talt holds a population of the rare Arctic Charr (*Salvelinus alpinus*) and a population of white-clawed crayfish (*Austropotamobius pallipes*). The rare Red Data Book species Oak Fern (*Gymnocarpium dryopteris*) has been recorded from the site and the rare snail Geyer's Whorl Snail (*Vertigo geyeri*) occurs on its northern side.

## 6.5.2 Conservation Objectives

The Conservation Objectives for Lough Hoe Bog SAC are as follows, as outlined by NPWS:-

- To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) in Lough Hoe Bog SAC,
- To restore the favourable conservation condition of Blanket bogs (* if active bog) in Lough Hoe Bog SAC,
- To restore the favourable conservation condition of Geyer's Whorl Snail in Lough Hoe Bog SAC, and,
- To maintain the favourable conservation condition of White-clawed Crayfish in Lough Hoe Bog SAC.

## 6.5.3 Potential Threats

The threats, pressures and activities with impacts on the SAC[42] are listed below in Table 6-7.

**Table 6-7 – Threats, Pressures and activities with impacts on Lough Hoe Bog SAC**

| Rank | Threats and pressures (type) |
|---|---|
| High | Burning down |
| High | Forest planting on open ground |
| High | Mechanical removal of peat |
| High | Wind energy production |
| Medium | Grazing |

## 6.5.4 Qualifying Interests

Lough Hoe Bog SAC is directly adjacent to the Proposed Development in upland areas and Lough Talt lies within this designated site. Examination of the QIs of Lough Hoe Bog SAC (NPWS, 2017) potentially subject to adverse effects from the Proposed Development are outlined in

Table **6-8** which includes an analysis and evaluation of the potential for impacts.

[41] https://natura2000.eea.europa.eu/Natura2000/sdf/#/sdf?site=IE0000633&release=55

[42] https://biodiversity.europa.eu/sites/natura2000/IE0000633

**Table 6-8 – Review of qualifying interests of Lough Hoe Bog SAC**

| QI Habitats/Species | Assessment of Potential for Adverse Effects | Potential for Adverse Effects |
|---|---|---|
| Oligotrophic waters [3110] | NPWS Conservation Objectives documentation (NPWS, 2017), details this habitat occurring in several smaller lakes within the SAC, rather than Lough Talt which is noted to be potential hard oligo-mesotrophic waters.<br>There is no direct or indirect connectivity from the Proposed Development to this QI habitat. Given the lack of any connectivity, there is not a complete source-pathway-receptor chain for impacts from the Proposed Development to this qualifying interest. Therefore, effects on the conservation objectives for this qualifying interest can be ruled out at this stage. | No |
| Blanket bogs [7130] | The full extent of this habitat within the SAC is unmapped.<br>As a result of the unmapped locations of this habitat, there is potential to impact this habitat should work affect the water quality within surface water features crossed by the Proposed Development. | Yes |
| *Vertigo geyeri* (Geyer's Whorl Snail) [1013] | This species is now absent from the SAC, however, habitat suitable for this species is located on the eastern side of Lough Talt (Figure 4-5).<br>Any interruption in ground water flows, or potentially a deterioration in water quality, resulting from the Proposed Development could impact fen / wetland habitats that could support this species in the future. | Yes |
| *Austropotamobius pallipes* (White-clawed Crayfish) [1092] | This species is primarily associated with Lough Talt within the SAC.<br>This species has the potential to be affected should the Proposed Development result in a deterioration of water quality within the surface water features crossed by the route or within Lough Talt. | Yes |

## 6.5.5 Identification of Potential Impacts on Lough Hoe Bog SAC

### 6.5.5.1 Construction Phase Impacts

The proposed pipeline route runs alongside the Lough Hoe Bog SAC for approx. 4 km as it crosses the Ox Mountains. Prior to reaching the shores of Lough Talt, approx. 2 km of the pipeline will be installed within the R294 roadway, where qualifying interest blanket bog habitat is present to the south of the road corridor. As trenching works will be confined to the road corridor, no direct impacts on adjacent blanket bog habitat will occur. Along this section, the pipeline crosses three small watercourses, all of which flow downhill out of the Lough Hoe Bog SAC and ultimately connect to the River Moy SAC and/or the Killala Bay/Moy Estuary SAC and SPA. Potential impacts on these watercourses and their associated European sites have been assessed in Sections 6.1, 6.3 and 6.4 respectively. As these watercourses flow out of, rather than into, Lough Hoe Bog SAC, there is no potential for impacts on this SAC

via these hydrological pathways as a result of the roadway trenching works. Trenching will be relatively shallow (approx. 1.5 m in depth) and as such will not affect local groundwater quality or impede groundwater flows. Consequently, works along this 2 km section of the pipeline, which runs alongside qualifying interest bog habitats within the Ox Mountains, will not give rise to effects on the SAC via groundwater pathways.

Following this, the proposed pipeline continues along the R294 and runs directly alongside Lough Talt for approx. 2 km, which is part of the Lough Hoe Bog SAC. The pipeline will cross one unnamed stream and seven drainage ditches that connect to Lough Talt. The unnamed stream and one drainage ditch will be crossed adjacent to the road, while the remaining crossings will take place within the roadway corridor, where the pipeline will be installed beneath existing culverts. As a result, there will be no interaction with open channel watercourses or associated riparian habitats at these on-road drainage ditch crossings.

Site surveys recorded no discernible flow within the unnamed stream, and most drainage ditches were dry at the time of site visits. Neither the stream nor the wet ditches were identified as having any fisheries value. The approx. 20 m off-road crossing of the unnamed stream will be carried out using pipe jacking techniques and represents the only location across the entire development where works are proposed directly within the Lough Hoe Bog SAC. No qualifying interest habitats are present at this crossing. Site surveys confirmed the area is dominated by mown amenity grassland, a small stream channel with no visible flow, scattered trees, and tall ruderal vegetation, primarily rosebay willowherb. No wetland habitats suitable for supporting the qualifying interest species Geyer's Whorl Snail (*Vertigo geyeri*) occur at the crossing location or within 100 m of it, the fen habitats that historically supported *V. geyeri* are located on a separate headland approx. 130 m from the stream crossing point (Figure 4-5). Lough Talt lies approx. 15 m from the unnamed stream crossing and is known to support the qualifying interest species White-clawed Crayfish, as well as non-qualifying species such as Arctic Char.

Given the close proximity of the stream crossing to Lough Talt, there is potential, if unmitigated, for construction related silt, sediment or other contaminants to enter the lake and temporarily affect water quality and associated aquatic species. However, owing to the small scale and short duration of the pipe jacking works (approx. 1 – 2 days), any such effects would be localised, temporary and not significant. On this basis, significant impacts on QI species White-clawed Crayfish are considered unlikely. Mitigation measures to prevent adverse effects on the water quality of Lough Talt are outlined in Chapter 7.

As noted above, the pipeline will be installed along the lakeshore section of the R294 for approx. 2 km. Trenching works in this area will be confined to a single lane and undertaken in short sections of approx. 100 m to allow the continued flow of traffic. In some locations, particularly where there are no natural barriers such as berms, bunded verges or dense vegetation, there is potential for sediment laden runoff from excavations to enter Lough Talt. It is also noted that this section of road lacks surface water gullies that could otherwise convey runoff away from the lake. In the absence of appropriate mitigation, sediment runoff could result in a temporary, localised deterioration in lake water quality, with potential impacts on QI species White-clawed Crayfish. Mitigation measures to address these risks during roadway trenching works are also detailed in Chapter 7.

The pipeline will be installed at a depth of approx. 1.5 m below road level and, given this shallow depth, will not result in significant interaction with the local groundwater body. Project specific ground investigation data from trial pits indicate that groundwater seepage was encountered at approx. 2.5 m below road level at the unnamed stream crossing, and at an average depth of 1.92 m across six trial pits along the 2 km stretch of the R294. As the pipeline installation will not intersect the groundwater table, no impacts on groundwater quality or the local hydrogeological regime are anticipated. Consequently, there will be no effects on groundwater dependent ecosystems, including fen habitats along the lake shore. Details of ongoing measures to enhance groundwater flows to shoreline fen habitats, aimed at improving wetland conditions suitable for *Vertigo geyeri*, are provided below.

### 6.5.5.2 Operational Phase Impacts

The operational phase of the Proposed Development must be considered in the context of the 2019 planning permission for the Lough Talt Water Treatment Plant (WTP) Upgrade, granted by Sligo County Council under Planning Reference PL 18/210. That permission represented the first application in Ireland of the Imperative Reasons of Overriding Public Interest (IROPI) provisions of Article 6(4) of the Habitats Directive[43]. The consent enabled the continued operation and upgrading of Lough Talt WTP as a critical public drinking water supply serving approximately 13,000 people following prolonged boil water notices and persistent non compliance with EU Drinking Water standards. The Lough Talt abstraction is within Lough Hoe Bog SAC which designated for Annex I habitats and Annex II species, including *V. geyeri*. Long term abstraction from Lough Talt has resulted in seasonal and drought driven drawdown of lake and groundwater levels, drying groundwater fed fen habitats and contributing to the local extirpation of *V. geyeri* by 2007. The Appropriate Assessment undertaken for the Lough Talt WTP Upgrade concluded that it could not be ruled out, beyond reasonable scientific doubt, that the WTP project, when considered in combination with continued abstraction, would adversely affect the integrity of the SAC, and that these impacts could not be reduced to acceptable levels through mitigation under Article 6(3). In the absence of feasible alternative water supplies in the short to medium term, and given the overriding public imperative, the Lough Talt WTP development progressed to Article 6(4), where consent was granted subject to a specific framework of compensatory measures[44].

The compensatory framework established under the 2019 IROPI permission is explicitly habitat and species led, designed to mirror the conservation objectives that would apply if *V. geyeri* were still present within the SAC. Its core objective is to secure long term hydrological stability and restore suitable fen microhabitat conditions through active intervention such as irrigation measures and habitat monitoring. Delivery of the framework has been structured as a phased, evidence based process comprised of baseline hydrological and ecological assessment, installation of irrigation infrastructure, detailed monitoring of macro and micro habitat responses, and afterwards the potential translocation of *V. geyeri* which will be informed by habitat comparison with functioning donor sites (such as Drumman Lough). As documented in the 2023 Steering Committee Review (McAdams, 2023[45]) for the compensatory framework, measures undertaken to date include the design and installation of the irrigation system, deployment of comprehensive groundwater, soil moisture and microclimate monitoring equipment, and the completion of baseline habitat assessments. Importantly, in accordance with the phased approach, no translocation of *V. geyeri* has occurred yet, and will not occur until there is confirmation that stable and suitable habitat conditions have been achieved.

In this context, the Proposed Development helps and aids the long term solution envisaged by the 2019 IROPI decision and directly addresses the principal constraint identified in that permission, i.e. the continued need to abstract from Lough Talt for public water supply. In operational terms, the Proposed Development directly fulfils the core condition underpinning the 2019 IROPI decision by providing a secure drinking water supply for the region and enabling the cessation of abstraction from Lough Talt. Cessation helps fulfil the planning conditions by eliminating the hydrological drawdown of Lough Talt. From an operational phase perspective, the removal of abstraction will help lake levels and groundwater fed fen hydrology to recover naturally and helps to reinstate the stable saturation, surface wetness and vegetation structure required by *V. geyeri*. While interim irrigation and monitoring measures provide resilience during the abstraction period, the cessation of abstraction enables the compensatory framework to transition towards self sustaining, natural ecosystem functioning. Accordingly, the Proposed Development does not replace the 2019 compensation framework but helps complete it, facilitating long term habitat restoration and supporting the ultimate objective of enabling the future reestablishment of a viable *Vertigo geyeri* population within the Lough Hoe Bog SAC once appropriate habitat conditions are restored.

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[43] RPS (2018). Lough Talt RWSS Water Treatment Plant Article 6(4) Assessment of Alternative Solutions and Imperative Reasons of Overriding Public Interest Vol 2.

[44] RPS (2018). Lough Talt RWSS Water Treatment Plant Article 6(4) Compensatory Measures Vol 3.

[45] McAdams, A. 2023. Status of habitat suitable for rehabilitation for the rare Geyer's Whorl Snail (*Vertigo geyeri*) at Lough Talt in the Lough Hoe Bog Special Areas of Conservation (SAC). Steering Committee Review 2.

### 6.5.6 Impact Assessment - Non-Qualifying Annex I Blanket Bog habitats in the Ox Mountains near Lough Hoe Bog SAC

This section outlines the presence of non-qualifying Annex I habitats located outside, but in close proximity to, Lough Hoe Bog SAC. It assesses whether potential impacts arising from the Proposed Development on these habitats could influence the Conservation Objectives of the Lough Hoe Bog SAC.

The proposed Windy Gap Break Pressure Tank is located in the Ox Mountains within an area of cutover blanket bog, a habitat that has been previously modified by peat extraction but which has naturally revegetated with typical bog species such as heather, purple moorgrass, and Sphagnum mosses. Although this habitat is considered to be of county ecological importance, it lies outside of Lough Hoe Bog SAC (approx. 330m distance), and NPWS datasets classify it as non-qualifying Annex I blanket bog [7130]. No trees, surface water features, or notable terrestrial faunal habitat occur at the site, and no invasive plant species were recorded during surveys.

Construction of the break pressure tank will result in direct but highly localised loss of cutover bog (approx. 93 $m^2$) within the immediate footprint of the tank and small areas of associated infrastructure (e.g. control boxes). However, the Proposed Development design incorporates measures to minimise habitat alteration by burying the tank and connecting infrastructure beneath reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. All peat excavated during the works will be carefully salvaged for reinstatement or used to form low bunds around the site, ensuring that all peat resources are retained on site.

Given the limited scale and duration of the works, and the implementation of appropriate peat handling and restoration practices under ecological supervision, impacts on cutover blanket bog at this location are expected to be small scale, localised, and not significant. The involvement of an Ecological Clerk of Works to oversee habitat reinstatement and general ecological protection will ensure that the ecological integrity of the cutover bog is maintained and that no long term adverse effects to the surrounding bogland habitats arise.

The Windy Gap Break Pressure Tank site is relatively small and works will have no affect any bogland habitat outside of the Proposed Development red line boundary. Ground investigations for the Proposed Development, including boreholes, recorded groundwater levels at the Windy Gap site at depths exceeding 6m below ground level, which is well below the proposed excavation depth of approx. 3 m. The limited scale excavations and associated infrastructure works are therefore not expected to have any significant effects on local groundwater quality at this elevated location.

The proposed works will not impede groundwater flow or alter recharge rates. As activities will be confined to the tank site, where there are no watercourses, and no habitats suitable for ex-situ qualifying interest species (e.g. Vertigo species or freshwater crayfish), there is no pathway linking the tank site to Lough Hoe Bog through which impacts could occur. Accordingly, no indirect effects on the Lough Hoe Bog SAC are anticipated during either the construction or operational phases of the break pressure tank. It should be noted the mitigation measures proposed for the salvage and reinstatement of peat are highly localised and are not designed or intended to protect the integrity of Lough Hoe Bog SAC.

## 6.6 Scour Management

As detailed in the Project Description (Section 1.9), scour management is required as part of the operation, commissioning and maintenance of the proposed water supply infrastructure. Scour management forms an integral part of the safe operation, commissioning and maintenance of the proposed water supply infrastructure. A range of fittings, including scour valves, hydrants, air valves, flow meters and pressure control devices, will be installed in accordance with Uisce Éireann standards to facilitate controlled drainage and maintenance of the network. For all pipelines, scour valves are located at low points along the route. For the seven key locations, site specific arrangements at key infrastructure locations such as Lisglennon WTP, Bonniconlon Reservoir, Windy Gap BPT and Lough Talt WTP will be implemented. Maintenance activities such as scouring will be infrequent and undertaken in a

manner that avoids release of chlorinated water to the environment, with flows directed to appropriate infiltration areas or removed off-site where necessary thereby avoiding discharge to water courses. The incorporation of advanced telemetry and automated control will enable continuous monitoring of flows, pressures and water quality, allowing for rapid response to any potential issues and ensuring the system operates within defined parameters at all times. All discharge methods are subject to detailed risk assessment and agreement from relevant stakeholders.

In the context of European sites, the assessment has focused on identifying potential pathways by which scour and dewatering activities could affect qualifying interest habitats and species within the zone of influence of the Proposed Development. The potential impact associated with scour activities relates to the discharge of water to the receiving watercourses, with particular consideration given to water quality and downstream ecological receptors. However, the process only allows raw water or dechlorinated treated water to be discharged during scour and flushing operations. This ensures that no chlorinated or chemically treated water enters any receiving watercourse, thereby eliminating potential impacts on water quality and aquatic species. As a result, there is no potential for adverse effects on QI aquatic habitats or species associated with downstream European sites.

Where discharge to the environment is required, flows will be carefully controlled and gradual, with discharge locations selected based on their capacity to assimilate flows without causing erosion, sediment mobilisation or ecological disturbance. In cases where discharge is not considered appropriate, water will be fully contained and tankered off-site. Consequently, the potential for significant changes in water quality, flow regime or supporting habitat conditions affecting qualifying interest species or habitats is avoided. Given that discharged water will be free from treatment chemicals and released at controlled rates, the potential for adverse effects on aquatic habitats, species and hydromorphological processes is very low. The receiving watercourses identified are generally of low ecological sensitivity or have sufficient dilution capacity, and site-specific assessments have confirmed that no significant environmental or ecological impacts are anticipated at any of the proposed discharge locations.

On this basis, scour and dewatering activities will not result in significant impacts and will not adversely affect the integrity of any European site. No significant effects on qualifying interest habitats, qualifying interest species or supporting habitats of European sites are predicted.

## 6.7 Impact Assessment Summary

In summary, the assessment identifies that potential impacts from the Proposed Development are primarily related to construction phase activities and, in particular, the risk of deterioration in water quality, hydrological interactions, and temporary, short term disturbance to qualifying interest species.

For the River Moy SAC, potential impacts arise mainly from sedimentation or pollution affecting aquatic habitats and species, including fens, alluvial forests, lamprey, salmon, white-clawed crayfish and otter, where hydrological connectivity exists. For Lough Conn and Lough Cullin SPA, impacts are limited to short term disturbance to birds during construction, with no significant effects on habitats or prey resources anticipated.

In the case of the Killala Bay/Moy Estuary SAC and SPA, potential impacts relate to indirect water quality effects and minor disturbance to waterbirds; however, these risks are low due to the absence of in-stream works and the limited scale and duration of works activities.

For Lough Hoe Bog SAC, potential impacts are associated with temporary water quality effects on sensitive habitats and species during construction, although the operational phase provides a long term positive effect through cessation of abstraction and restoration of hydrological conditions.

Appropriate mitigation measures, particularly those relating to water quality protection, sediment control, and construction management, will be required to ensure that no adverse effects on the conservation objectives of any European site occur.

# 7. Mitigation Measures

As demonstrated in Section 6 above, the proposed works have the potential to adversely affect the integrity of European sites with connectivity to the Proposed Development. This section prescribes mitigation measures to further control any impacts from the proposed works to minimise the potential for such effects in combination with other plans or projects.

The development of the mitigation measures has followed the "mitigation hierarchy", which prioritises avoidance over reduction, and actions at source over pathway over receptor, as follows:

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

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

## 7.1 Design Stage Mitigation Measures

A range of avoidance led design measures has been incorporated into the Proposed Development to minimise ecological impacts from the outset, which include:-

- Using trenchless techniques (e.g. HDD and pipe jacking) at major watercourses, including the River Moy SAC Brusna River and all ecologically sensitive streams, to avoid instream works and direct disturbance to aquatic habitats and species.
- Reusing the existing sub-estuarine trunk main for the River Moy Estuary crossing, avoiding impacts to qualifying interest intertidal habitats associated with Killala Bay/Moy Estuary SAC and avoid impacts to SPA birds associated with Killala Bay/Moy Estuary SPA.
- Routing approx. 24.65 km of the 30.2 km pipeline within existing road corridors to avoid interaction with European sites.
- The intake screening, and any required associated intake components, will have anti-fouling surfaces that significantly reduce the ability of zebra mussels to attach and colonise.

### 7.1.1 Fish Return System Design

The following fish return system design measures will avoid fish entrainment, maintain fish populations within Lough Conn, and protect other lough species dependent on fish populations, including otter and waterbirds.

- The intake screening and fish protection measures will be designed in accordance with recognised best practice for the protection of eels, elvers and other fish species at water abstraction intakes, including the principles set out in *Screening at Intakes and Outfalls: Measures to Protect Eel* (Environment Agency, 2011).
- The intake screening and fish return system will be designed to comply with the requirements of the Habitats Directive (92/43/EEC), Water Framework Directive (2000/60/EC) and Council Regulation (EC) No. 1100/2007 on the recovery of European eel stocks.
- The intake will incorporate a low velocity abstraction system with a maximum approach velocity of ≤ 0.10 m/s to minimise the risk of fish impingement and entrainment.

- A primary intake screen of mesh aperture approx. 20 mm will be installed at the intake head to prevent the entry of larger fish and aquatic fauna into the abstraction system.
- The intake will incorporate a dedicated fish return system comprising a continuous, unobstructed and hydraulically suitable return route to Lough Conn, ensuring that any fish entering the screening system are safely returned to the lake.
- Downstream of the fish return system, a fine screen with a maximum mesh aperture of 2 mm - 3 mm will be provided to prevent the entrainment of juvenile fish, eels, elvers, lamprey and other small aquatic organisms.
- Screen cleaning will be undertaken using a low pressure self cleaning spray bar system (≤ 1 bar) to minimise the potential for injury or mortality of intercepted fish.
- Fish passage and screening performance will be monitored using underwater fish counters, cameras and/or other approved monitoring technologies, as agreed with Inland Fisheries Ireland.
- Where required, screen mesh apertures will be refined to dimensions smaller than 3 mm, subject to the requirements of Inland Fisheries Ireland.
- Operational noise generated by the intake and screening infrastructure will not exceed:
  - 45 dB LAr,T during daytime hours (07:00-19:00);
  - 40 dB LAr,T during evening hours (19:00-23:00); and
  - 35 dB LAeq,T during night-time hours (23:00-07:00).

## 7.2 Preconstruction Mitigation Measures

### 7.2.1 Confirmatory surveys

In advance of works, the Contractor's Ecological Clerk of Works (ECoW) or the Contractor's appointed ecologist will complete preconstruction otter surveys of the following watercourses, to ascertain if there have been any changes in activity since the previous surveys were carried out, with the aim to avoid interaction with and impact to Qualifying Interest (QI) otter species:

- Otter breeding/resting sites at the Brusna River crossing, and all other stream crossings for 50 m upstream and downstream of the crossing points. Otter surveys will be carried out having regard to guidance of NRA (2009)[46].

### 7.2.2 Reporting

The results of preconstruction surveys will inform the refinement of mitigation measures (if required) which will be included the updated Construction Environmental Management Plan (CEMP) which the Contractor will be required to adhere to, and all results will be incorporated into the Contractor's constraint mapping. Survey reporting and mapping will also be provided to the Uisce Eireann and as additionally required by any planning conditions. Should an otter holt, couch or breeding site be identified during the pre-construction surveys, standard mitigation measures and exclusion distances, as advised by the project ecologist and in accordance with relevant guidance and licensing requirements where applicable, will be implemented to avoid disturbance to otters.

[46] NRA (2009) Guidelines for the treatment of otters prior to the construction of national road schemes.

# 7.3 Construction Stage Mitigation Measures

## 7.3.1 Construction stage monitoring

All works carried out within or near ecologically sensitive areas, i.e. within an SAC/SPA, at loughs, at watercourse crossings will be supervised by a suitably qualified Ecological Clerk of Works (ECoW). The ECoW will be fully informed of all mitigation measures and the reasons for which they are required. Such measures include, for example, the installation and removal of silt control measures (silt curtains, silt fences, silt traps). The ECoW and Site Manager will be responsible for the monitoring of mitigation measures implemented for the duration of the construction works in order to ensure they are effective and are working as required. The locations of where ECoW monitoring and supervision will occur is listed in Table 7-1.

### 7.3.1.1 Ecological Clerk of Works

An ECoW will be appointed by the Contractor in advance of construction.

All works carried out within ecologically sensitive areas; at surface water features (lough and watercourses) will be supervised by a suitably qualified ECoW.

The ECoW will: -

- Be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), the Institute of Environmental Management or equivalent; and
- Have demonstrable experience with overseeing construction in designated conservation sites.

In the CEMP, which the Contractor will be required to adhere to, the Contractor will provide all necessary method statements to the ECoW to demonstrate how these mitigation measures will be implemented. Such method statements will include the installation and removal of silt control measures (silt curtains, silt fences, silt traps).

The ECoW will be responsible for monitoring the Contractor and identifying to the Contractor any additional or refined mitigation measures (i.e. adaptive management measures required). The ECoW will concisely report the findings of monitoring, including any adaptive management measures recommended to the Contractor, and the effectiveness of same.

The ECoW will have the authority to ensure all mitigation measures are being implemented effectively and will have the authority to stop works activities if required.

The ECoW and Site Manager will deliver site induction and training to all construction personnel prior to commencement of construction activities. The Contractor will maintain a record of training completed, which will be made available to the Developer upon request if required.

The ECoW will monitor Met Éireann's weather forecast and will instruct the Contractor that works within 50m of watercourses and loughs will not be permitted within 24 hrs of Met Éireann issuing a yellow, orange or red weather warning.

The ECoW will monitor all construction works within 50 m (as per criteria above) of the surface water features with potential connectivity to European sites.

The Contractor (following ECoW advice and recommendations) will be responsible for the implementation of mitigation measures. In the unlikely event that the implemented measures are not performing effectively, emergency

measures will be put in place e.g. bunding or spill kits and all works will cease immediately. This will ensure that mitigation measures are responsive to unexpected issues that may arise on site during the construction works.

## 7.4 Surface Water Protection and Aquatic Species Mitigation Measures

The following Development specific surface water mitigation measures will be implemented during the construction phase.

### 7.4.1 Off Road Surface Water Feature Crossings

The following surface water quality mitigation measures will be at implemented at all open channel watercourses crossed by the pipeline off roadways, this includes the Brusna River, the Moy Estuary, EPA identified open channel streams and one field drain near Lough Talt. The locations of these Off Road areas is provided in Table 7-1 below.

The following surface water mitigation measures will be implemented to avoid potential adverse impacts from contaminated runoff from the Proposed Development site.

- No tracking of plant and equipment is permitted across any open channel river or stream or drain containing water flow.
- The Contractor shall identify all surface water features near works locations (including watercourses and ditches, which may be affected by the works) and no discharge of silted or contaminated waters to these surface water features is permitted.
- Materials which may cause pollution, including but not limited to; fuels, oils, hydrocarbons, cementitious materials, shall not be stored within 50 m of open channel surface water features.
- Any generators or pumps will be installed on drip trays, with any captured contaminants (hydrocarbons or oils) disposed to a licenced waste facility.
- Any excavated materials will not be stockpiled within 20 m of open channel surface water features.
- Any waste materials, refuse or debris arising from the works site in the vicinity of surface water features shall be collected and removed as required so that none may be transported into the surface water features.
- Excavations will not be permitted within 50 m of an open channel watercourse within 24 hrs of Met Éireann issuing a yellow, orange or red weather warning; ECoW to monitor Met Éireann warnings.

#### 7.4.1.1 Silt Fences:

Silt fences are required between HDD / Pipe Jacking launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water feature. Refer to Table 7-1 for locations.

- Silt fences will be installed around the launch and reception pits between, and if possible downgradient of, the potential source of the silt/sediment and any open channel surface water feature.
- The silt fence will contain the area where silted waters are being generated and shall terminate on high ground,

- They shall be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material,
- Its base shall be embedded at least 15 cm into the ground and staked at 2 m intervals,
- The vegetated turves shall be peeled back and not detached from the ground, the materials inserted, and the turves replaced to hold the base in place,
- The silt fence will be inspected regularly by the ECoW and contractor during the working day and weekly during construction, and in particular following heavy rainfall,
- Silt fences shall remain in-situ for the duration of the watercourse crossing works,
- Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain,
- Silt fences will be inspected daily and after periods of heavy rainfall,
- Following completion of works the silt fence and stakes will be removed manually and only during dry conditions,
- A record of its installation, inspection and removal will be maintained by the ECoW.

#### 7.4.1.2 Dewatering:

Excavation works are required at HDD / Pipe Jacking launch and reception pits and groundwater may be encountered during such works. Should groundwater be encountered during excavations, the following measures will be implemented:

- Excavations will not be carried out during or following times of prolonged rainfall.
- The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of proposed treatment system, and discharge location.
- All groundwater / perched water removed from the excavation will be pumped to onsite temporary settlement tanks or filtration systems; where a proprietary settlement tank system is used, they are typically located on the stone or ground protection mat platform and water from the excavation will be allowed to settle in these prior to discharge.
- Following discharge of settled waters, any soil sediments remaining in the tanks / filtration systems will be reused where possible for landscaping purposes and / or infill where appropriate, ensuring that any residual soil waste is kept to a minimum. Any soil sediment not deemed suitable for landscaping or infill will be characterised and removed offsite in accordance with all relevant waste management legislation.
- No untreated water discharge will be permitted to any watercourses, field drains or ditches.
- The time period that excavations are left uncovered will be reduced in so far as reasonably practical with impermeable coverings being used to cover excavations over night or in times of heavy rainfall during working hours. These coverings will be secured at night to prevent mammals becoming trapped.

## 7.4.2 On Road Crossing Culverted Surface Water Features

The Contractor will employ the following mitigation measures at on road culverted surface water feature crossings;

- Maintain dry working conditions at culvert entry/exit points using appropriate barriers, pumps or containment as required.
- Install silt fencing/sediment traps at all culvert interfaces to prevent sediment-laden water entering drainage systems.
- Implement strict no discharge protocols for untreated waters to any drain.
- Store all fuels and hazardous materials in double-bunded facilities away from culvert inlets/outfalls.
- Ensure all excavated material is stored at a safe distance from culvert openings to run-off during rainfall.
- Minimise ground disturbance at culvert approaches and reinstate surfaces immediately following pipeline installation.
- Use clean stone only for backfilling around culverts, avoiding loose fines that could wash into watercourses.
- Ensure plant is well maintained, leak-free, and refuelled only at designated controlled locations.
- Maintain emergency spill kits at all culvert locations, with staff trained in their use.
- Undertake regular inspection of culvert protection measures, particularly after heavy rainfall.

### 7.4.3 Works at Wherrew RWI&PS Lough Conn

The following mitigation measures are prescribed for the works at the Wherrew RWI&PS and within Lough Conn waterbody;

**General Water Protection**

- Establish a clearly defined construction exclusion zone at the lake edge, preventing unnecessary access by personnel, plant or vehicles.
- Carry out all shoreline works in dry, contained conditions using cofferdams or equivalent isolation systems where required.
- Do not allow any construction runoff, concrete washout, fuels, oils, chemicals or fine materials to enter the lake at any stage.
- Maintain all machinery in leak-free condition and refuel only at designated, bunded locations remote from the lake.
- Store all materials, including stone, at a safe distance from the lake margin with appropriate containment measures.

**Sediment and Turbidity Control**

- Use only clean, washed stone free of fines for all rock armour, bedding or reinstatement works associated with pipeline installation.
- Install floating booms and silt curtains around in-lake works to ensure any turbid plumes are contained and allowed to settle.
- Avoid working during periods of high winds or heavy rainfall when sediment dispersal risk is elevated.
- Reinstate disturbed ground immediately so as to avoid silt laden run-off.

**Intake Pipeline Installation Measures**

- Installation / laying of the new intake pipe within Lough Conn waterbody is not be permitted during the months when SCI birds are overwintering within Lough Conn and Lough Cullin SPA, namely October to March inclusive.
- Works directly within Lough Conn waterbody is only to be undertaken during the months of April–September inclusive.
- Lay the pipeline using floating pontoons and controlled lowering to minimise bed disturbance.
- Restrict the footprint of works to the minimum area needed and avoid any dredging or unnecessary disturbance to the lake substrate.
- Install rock armour over the pipeline using controlled placement from pontoon or from shore using long-reach equipment, ensuring no plant enters the water.
- Avoid any accidental release of material into the lake by using controlled loading and transfer procedures at the pontoons.

**Dewatering and Water Handling**

- Electro-fish the coffer-dammed waters, by a suitably qualified and licenced expert, and return any caught fish to the lough prior to any pumping works.
- Pump any water removed from isolated cofferdam working areas back into the lake only after it has been fully settled and is free of visible suspended solids.
- Do not discharge any untreated water to the lake.

**Protection of Aquatic Ecology**

- Use low velocity intake heads and fine mesh screens on any temporary abstraction or pumping equipment to prevent the entrainment of fish.
- Maintain quiet working methods to reduce disturbance to birds and aquatic fauna using the nearshore zone.
- Avoid works during nighttime, and also early morning and dusk periods where possible to reduce indirect disturbance to foraging species.

**Invasive Species Prevention**

- Implement full biosecurity measures for all plant, equipment, pontoons and materials used at the waterbody, including inspection, cleaning and disinfection before mobilising to site.
- Ensure no movement of water, sediment or equipment from Lough Conn to any other waterbody without full decontamination.
- Use only lake-specific pumps, hoses and temporary works equipment to avoid transfer of zebra mussels or other aquatic invasive species.

**Emergency Preparedness**

- Maintain spill kits at all shoreline working locations and ensure all staff are trained in their use.
- Stop works immediately if any pollutant or sediment release occurs, contain the incident, and implement corrective actions before recommencing.
- Keep a site-specific emergency response plan available and briefed to all site personnel.

**Site Reinstatement**

- Restore all disturbed shoreline areas to their original profile using clean stone material and natural contours.

- Stone material for shoreline infill should be sourced locally and match the surrounding geology of the lake.
- Reinstate any temporary access routes or working platforms, ensuring all imported materials are removed and ground conditions stabilised.

### 7.4.4 Works at Moy Estuary Crossing

The following mitigation measures will be employed at the west bank and east bank tie in locations to the existing culvert under the Moy Estuary;

- No tracking of plant and equipment is permitted within the estuarine waterbody nor intertidal areas.
- Silt fences will be installed between the tie in locations and the estuary channel.
- Silt fence mitigation measures will be employed as per off road surface water crossings.
- Materials storage mitigation measures will be employed as per off road surface water crossings.
- Dewatering mitigation measures will be employed as per off road surface water crossings.

### 7.4.5 Pipeline Works adjacent to Lough Talt

The Contractor will employ the following mitigation measures along the c. 2km section or works alongside Lough Talt;

- Do not allow plant, machinery or personnel to enter the lake waterbody at any time.
- Prevent tracking of machinery on soft ground adjacent to the lake.
- Use only clean, washed stone free of fine material for any trenching works.
- Do not stockpile excavated material or stone within close proximity of the lake edge; store materials on level ground with containment away from surface water pathways.
- Maintain all fuel, oils and chemicals in secure bunded areas away from the lake margin.
- The ECoW will assess the works zones for areas where there is no physical or vegetative barrier to prevent run-off and silt fences will be installed where required.
- Install silt fencing or cut-off drainage on any sloped ground draining toward Lough Talt to intercept suspended material.
- Cover and stabilise any exposed soils immediately following trench backfilling to prevent run-off.
- Avoid works during periods of high rainfall.
- Ensure no discharge of untreated or contaminated waters to Lough Talt.
- The ECoW will implement continuous visual lake water quality monitoring, for sediment or turbidity, during shoreline works to ensure there is no contaminated run-off the lake waterbody.

### 7.4.6 Hydrocarbon/chemical pollution mitigation measures:

In order to prevent any potential surface water impacts via. release of hydrocarbon/chemical contaminants the following standard measures will be implemented at all works areas as required:

- Fuels, lubricants and hydraulic fluids for equipment used at the works area, as well as any solvents, oils, and paints will be handled so as to avoid spillage, properly secured against unauthorised access or vandalism, and will be provided with spill containment equipment/systems.

- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the works area for disposal or re-cycling.

- A response procedure prepared by the Site Manager/ECoW will be put in place to deal with any accidental spill events. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained by the contractor and the contaminated soil removed from the works area and properly disposed of in accordance with all relevant waste management legislation.

The following mitigation measures will also be implemented in full for mitigation of construction related contaminants:

- All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area.

- The Contractor will ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity.

- No oils will be stored in works areas, oils will be stored within site compounds only.

- Generators, pumps and similar plant will be placed on drip-trays to prevent contamination,

- All temporary construction fuel tanks will also be located in a suitably bunded area within the construction compound.

## 7.5 Invasive Species Mitigation (Zebra mussel)

The following measures will be employed at the Wherrew RWI&PS works area;

- Implement full biosecurity protocols for all equipment used at Lough Conn or Lough Talt, including cleaning, drying and disinfection before moving to another waterbody.
- Prohibit movement of water, sediment, equipment or boats from Lough Conn/Talt to other freshwater sites without full decontamination.
- Avoid transferring any aquatic material during abstraction works by ensuring intake structures, pumps and hoses remain lake specific.
- Use intake infrastructure designed to prevent zebra mussel attachment (e.g., specialist coatings and fine mesh screening).
- Ensure all temporary water management (pumping, bypassing) uses dedicated equipment that does not move between infested and non-infested waters.
- Train all contractors in invasive species identification and response procedures before commencing works.
- Monitor intake structures periodically after installation to ensure no establishment or accumulation occurs.

### 7.5.1 Additional construction phase mitigation measures

The Contractor shall employ good practice environmental and pollution control measures with regard to current best practice guidance such as Environmental Good Practice Onsite Guide (CIRIA, 2023);

The construction management of the site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides 'Control of Water Pollution from Construction Sites' and 'Groundwater control – design and practice' to minimise as far as possible the risk of pollution.

## 7.5.2 Locations for Construction Phase Mitigation Measures

Table 7-1 below outlines the locations where the aforementioned mitigation measures will be employed.

**Table 7-1 – Locations for Mitigation Measures**

| Location | On Road / Off Road | Chainage | Watercourse Crossing Methodology | Mitigation Measures | ECoW Supervision & Monitoring |
|---|---|---|---|---|---|
| Wherrew RWI&PS / Lough Conn | N/A | N/A | N/A | Refer to Section 7.4.3, 7.4.6 & 7.5 | Y |
| Moyne Stream Crossing | On | 880 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Newtownwhite Stream Crossing | On | 2600 | Trenchless | Refer to Section 7.4.2 & 7.4.6 | Y |
| Broadlands of Knockafarson Stream Crossing | On | 2900 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| No Name Stream Crossing | On | 3520 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Abbeytown Stream Crossing | Off | 3720 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| No Name Stream Crossing | Off | 3880 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| Roadway trenching next to Wetland Site | On | 4700-5540 | N/A | Refer to Section 7.4.2 & 7.4.6 | Y |
| Field Drain Crossing | Off | 5630 | Open Cut | Refer to Section 7.4.1 & 7.4.6 | Y |
| Illanamuck Stream Crossing | On | 8020 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Moy Estuary Stream Crossing | Off | 10200 | Existing duct | Refer to Section 7.4.4 & 7.4.6 | Y |
| Field Drain of Crossing | On | 11830 | Trenchless | Refer to Section 7.4.2 & 7.4.6 | Y |

| Location | On Road / Off Road | Chainage | Watercourse Crossing Methodology | Mitigation Measures | ECoW Supervision & Monitoring |
|---|---|---|---|---|---|
| Field Drain Crossing | On | 12610 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Brusna River Crossing | Off | 15280 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| No Name Stream Crossing | On | 16860 | OC or Trenchless | Refer to Section 7.4.2 & 7.4.6 | Y |
| Fiddaun Stream Crossing | Off | 17220 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| Srafaungal Stream Crossing | Off | 17850 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| Bunnyconnellan West Stream Crossing | Off | 20470 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| Field Drain Crossing | On | 21050 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Srafaungal Stream Crossing | Off | 21700 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| No Name Stream Crossing | On | 25730 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Field Drain Stream Crossing | On | 25810 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| No Name Stream Crossing | On | 25970 | Trenchless | Refer to Section 7.4.2 & 7.4.6 | Y |
| Glenree Stream Crossing | Off | 26280 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| Field Drain Crossing | On | 27175 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Lough Talt Roadway | N/A | 27900-29900 | N/A | Refer to Section 7.4.5 & 7.4.6 | Y |
| Field Drain Crossing | On | 28830 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |

| Location | On Road / Off Road | Chainage | Watercourse Crossing Methodology | Mitigation Measures | ECoW Supervision & Monitoring |
|---|---|---|---|---|---|
| No Name Stream Crossing | Off | 28070 | Trenchless | Refer to Section 7.4.1 & 7.4.6 | Y |
| Field Drain Crossing | On | 28350 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Field Drain Crossing | On | 28730 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Field Drain Crossing | On | 28950 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Field Drain Crossing | On | 29295 | Open Cut | Refer to Section 7.4.2 & 7.4.6 | Y |
| Field Drain Crossing | Off | 29470 | Open Cut | Refer to Section 7.4.1 & 7.4.6 | Y |

# 8. In-Combination Effects

## 8.1 Requirement for Assessment

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

## 8.2 Approach and Methodology

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

## 8.3 Geographical Scope

In defining the geographical scope for identifying potential in-combination effects, it is important to remember that effects are evaluated in view of the conservation objectives of the European site(s) concerned. As such, two or more effects relating to the same conservation objective for a given European site would combine even if their geographical extents did not overlap. For example, the loss of a small area of an Annex I habitat type listed as a qualifying interest of a European site would combine with the loss of an entirely unconnected area of the same habitat type from a remote part of the same site to produce an in-combination effect, the significance of which would need to be evaluated in view of the relevant conservation objective. On that basis, the scope of the assessment of in-combination effects extends to all plans and projects affecting the same conservation objectives as the plan or project under consideration, irrespective of whether those effects are significant or not. In this case, however, given the scale of the Proposed Development and sensitivities of the European sites with connectivity, it was deemed most appropriate to include areas in close proximity to the Proposed Development and its zone of influence within the geographical scope for identifying potential in-combination effects.

## 8.4 Timescale

The timescale over which potential in-combination effects were considered in this case covered plans and projects from five years ago (i.e. 2021) to the present and all reasonably foreseeable future plans and projects, i.e. published draft plans and projects which are already in the planning system or have received planning permission.

## 8.5 Sources of Information

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

- Mayo County Council Planning Data viewed through; https://mayococo.maps.arcgis.com/apps/webappviewer/index.html?id=2b1fc4da0e214d25b5727fecb908ae27
- Sligo County Council Planning Data viewed through; https://sligococo.maps.arcgis.com/apps/webappviewer/index.html?id=c020a4e3d5564f96a40eeee995412ba3
- An Coimisiún Pleanála Planning Applications viewed through; https://www.pleanala.ie/en-ie/Map-Search
- Mayo County Development Plan 2022-2028[47]
- Sligo County Development Plan 2024-2030[48]
- Transport Infrastructure Ireland[49]

The threats, pressures and activities with negative impacts on the River Moy SAC, Lough Hoe Bog SAC, Killala Bay/Moy Estuary SAC/SPA and Lough Conn and Lough Cullin SPA were used to identify plans and projects which, by their nature, are likely to give rise to potential impacts on the sites concerned.

## 8.6 Assessment

Mayo County Development Plan (CDP) 2022-2028 and Sligo CDP 2024-2030 sets out policies and objectives for the development of the counties. The CDPs aim to promote the sustainable development and improvement of the economic, environmental, cultural and social aspects of the counties. The CDPs also require that any developments must be subject to AA process and that permitted developments comply with the requirements of the WFD, the relevant River Basin Management Plans and the Habitats Directive. A Strategic Environmental Assessment (SEA) was prepared for the CDPs and they went through the AA process. The findings of which were integrated into the objectives of the CDPs resulting in Plans that afford high levels of protection to the environment and European sites.

A review of Transport Infrastructure Ireland (TII) publicly available planned projects[50] identified no national road projects in close proximity to or with connectivity to the Proposed Development.

A search of Mayo County Council Planning, Sligo County Council Planning and An Coimisiún Pleanála planning applications has been undertaken for applications submitted within the ZoI of the proposed development (last accessed 13/05/2026). Near the proposed works, projects that have been granted planning permission include retention of existing developments, typical extensions to domestic dwellings or the construction of new domestic dwellings. Regarding potential impacts to water quality, these projects will have to comply with the EPA's Code of Practice for Wastewater Treatment Systems for Single Houses (EPA, 2009, 2018). These developments have conditions attached to their planning permission relating to sustainable development, such as siting of septic tanks, foul surface water and effluent drainage facilities, and clean surface water run-off drainage facilities. These residential property developments have no connectivity to the Proposed Development site and, given their locations, nature and scale, it is considered they will not, either alone or collectively, give rise to any likely significant effects on any European sites. Therefore, it is not anticipated that the developments that have been granted permission will have any significant effects in combination with the Proposed Development.

[47] https://consult.mayo.ie/sites/default/files/Vol.%201%20-%20Mayo%20CDP%2022-28%20Final.pdf

[48] https://www.sligococo.ie/cdp/

[49] https://www.tii.ie/projects/

[50] https://www.tii.ie/public-transport/projects-and-improvements/

Key developments which shall be considered are large scale developments in the region of the Proposed Development, there are thirty five of these developments which have been further assessed in terms of in-combination effects with the Proposed Development and are presented in Table 8-1 below.

It is considered that there are no Mayo County Council, Sligo County Council or An Coimisiún Pleanála approved and/or proposed plans or projects that will act in combination with the Proposed Development to give rise to significant in-combination effects on the European sites with connectivity to the Proposed Development.

**Table 8-1 – Committed developments in the vicinity of the Proposed Development**

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
|---|---|---|---|
| DPE63-14-2018 | Office of Public Works (OPW) | The proposed flood scheme for the River Deel is a diversion channel upstream of the town with a capacity of 110 cumec, which will redirect flood waters away from the town, directly to the flood plains of Lough Conn. The scheme will be designed to cater for the 1% Annual Exceedance Probability (AEP) flood event (also known as the 100 year flood event), but will also cater for a larger flood event as the diversion channel has additional capacity. This will safeguard against flooding associated with potential future climate change that could increase the size of the 100 year flood event. | This project has been subject to the Appropriate Assessment process which concluded;<br>*'Therefore, it can be concluded that the River Deel (Crossmolina) Flood Relief Scheme, beyond reasonable scientific doubt, will have no adverse effects on the qualifying interests, special conservation interests and on the integrity and extent of River Moy SAC (2298), and Lough Conn and Lough Cullin SPA (004228), provided that the mitigation and compensation measures are adhered to in full. Accordingly, the Proposed Development will not adversely affect the integrity of any relevant European site either individually or in combination with any other plan or project.'*<br>This flood relief scheme is upstream of the Proposed Development at the Lough Conn Wherrew RWI&PS and the NIS for the scheme details it will not adversely affect River Moy SAC or Lough Conn and Lough Cullin SPA. The Proposed Development has likewise been assessed, and with mitigation measures applied, no significant effects on either European site will occur as a result of the Proposed Development. As this Lough Conn waterbody connection is the only pathway shared by the two projects, and neither gives rise to significant effects, there is no potential for in-combination impacts on River Moy SAC or Lough Conn and Lough Cullin SPA or any other European site. |
| 319173 / 2360182 | BP Mitchell Haulage and Plant Hire Ltd. | Construction of Inert Waste Recovery Facility within an application area of *c*. 1.8 ha at Mullafarry, Killala, County Mayo. | This project has been subject to the Appropriate Assessment process and ACP as the competent authority concluded;:<br>*'In overall conclusion, the Board was satisfied that the proposed development, by itself, or in combination with other plans or projects, would not adversely affect the integrity of the European Sites, in view of the sites' conservation objectives.'*<br>Both the Waste Recovery Facility project and the Proposed Development have connectivity to Killala Bay/Moy Estuary SAC/SPA. The Waste Recovery Facility project has been assessed and is not predicted to give rise to significant effects on any European site through hydrological pathways. The Proposed Development has |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
|---|---|---|---|
| | | | likewise been assessed, and with appropriate mitigation measures applied, no significant effects on Killala Bay/Moy Estuary SAC/SPA will occur. As neither gives rise to significant effects, there is no potential for in-combination impacts on Killala Bay/Moy Estuary SAC/SPA or any other European site. |
| 322575 | Mayo Data Hub Limited | Construction of a data centre and all associated site works. An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) have been submitted with the planning application. | This data centre project has been subject to a Natura Impact Statement which concluded:<br>*'It is the conclusion of this NIS, on the basis of the best scientific knowledge available, and with the implementation of the mitigation and restriction measures set out under Section 3.6., that the possibility of any adverse effects on the integrity of the European Sites considered in this NIS (having regard to their conservation objectives), or on the integrity of any other European Sites (having regard to their conservation objectives,) arising from the proposed development, either alone or in combination with other plans or projects, can be excluded beyond reasonable scientific doubt.'*<br>The data centre project has no direct or indirect hydrological connectivity to the Proposed Development. The project does not involve groundwater or surface water abstraction, with operational water requirements supplied from the Uisce Éireann public water network and cooling provided through a closed-loop chilled water system. As a result, the project is not expected to affect groundwater levels, aquifer recharge, or surface water flows. As neither project is anticipated to result in significant effects on any European site, and given the absence of hydrological connectivity or shared water resource pressures between the projects, there is no potential for in-combination effects on any European site. |
| 313975 | Lisglennon AD Limited | A anaerobic digestion (ad) biogas facility and associated gas pipeline. comprising of: renewable energy project consisting of an ad biogas facility using locally sourced silage & slurry as feedstock to generate biogas for export to the national grid with | *This project has been subject to a Natura Impact Statement which concluded:*<br>*'Based upon the information provided in this NIS, it is the considered view of its the authors that it can be concluded by Mayo County Council that the project, alone or in-combination with other plans or projects, will not result in significant adverse effects to the integrity and conservation status of European Sites in view of their* |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | residual digestate being available for use locally as bio-fertiliser and associated site works. NIS included. | *Conservation Objectives and on the basis of best scientific evidence and there is no reasonable scientific doubt as to that conclusion.'*<br><br>There is potential connectivity between this biogas project and the Proposed Development as both projects involve laying a pipeline (one gas, one water) along the same roadway (R314) near Lisglennon. Both pipelines will cross the culverted Illanamuck Stream in Colleens village, this stream connects to the River Moy SAC. Both pipelines will be laid either under or over this culverted watercourse. The biogas project NIS outlines there is no potential for water quality effects on the Illanamuck Stream. Similarly, the Proposed Development will have no affect on the stream. Given that the stream is the only pathway to any European site and neither project will affect this watercourse / pathway, the two projects will not act in-combination to affect River Moy SAC. |
| 317560 | Mercury Renewables (Carrowleagh ) Limited | Proposed windfarm development including 13 wind turbines in Bunnyconnellan, Co. Mayo and hydrogen plant in Castleconnor, Co. Sligo. | This energy project has been subject to the Appropriate Assessment process which concluded:<br><br>*'In conclusion, in the light of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the proposed development will not adversely affect the integrity of any of the European sites concerned.'*<br><br>The energy project and the Proposed Project will involve crossing watercourses that connect to River Moy SAC (e.g. the Glenree River). The energy project NIS outlines that HDD will be used for watercourse crossings, prescribes appropriate surface water mitigation measures and will not result in any water quality impacts that could affect River Moy SAC. The Proposed Development has been assessed and with appropriate mitigation will similarly have no impact to River Moy SAC. As such, the two projects will not act in-combination to affect River Moy SAC. |
| 211063 | Ardagh GAA Club | Construction of 1 standalone building incorporating gym, meeting room and storage area. including all other ancillary site works and services | This GAA project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway there is no potential for in-combination effects on any European site. |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| 19260 | Killala Community Windfarm Designated Activity Company | 25 year permission for a single electricity generating wind turbine with an overall maximum height of up to 125 m. The development will also consist of a turbine hardstand, access track of c.394 m, internal cable trench of c.1,775 m and ancillary site works. The planning application is accompanied by a Natura Impact Statement | This project has been subject to a Natura Impact Statement which concluded:<br>*'No potential for water quality impacts from within the Proposed Development Site to result in significant effects on the Killala Bay/Moy Estuary SAC or the Killala Bay/Moy Estuary SPA. Consequently, it is considered that there is no potential for the loss of habitat within the Proposed Development Site to significantly affect the Conservation Objectives of the Qualifying Interests of the Killala Bay/Moy Estuary SPA.'*<br>This wind turbine project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 17619 | Killala Community Windfarm Designated Activity Company | 10 year planning permission for 5 turbine wind farm. proposed development will be located in the townlands of Magherabrack, Mullafarry, Tawnaghmore lower, Meelick and Tawnaghmore upper, Killala approx 1.3km south of killala. | This project has been subject to a Natura Impact Statement which concluded:<br>*'No potential for water quality impacts from within the Proposed Development Site to result in significant effects on the Killala Bay/Moy Estuary SAC or the Killala Bay/Moy Estuary SPA. Consequently, it is considered that there is no potential for the loss of habitat within the Proposed Development Site to significantly affect the Conservation Objectives of the Qualifying Interests of the Killala Bay/Moy Estuary SPA.'*<br>This wind turbine project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 21342 | Mullafarry Quarry Ltd | Filling of lands with inert waste for the purpose of quarry restoration, and all associated ancillary works | This landfill project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 211284 | MULLAFARRY QUARRY LTD | 1.0 hectare extension to an existing authorised quarry and will comprise of the following: extraction of material by blasting means down to a level of -2.0 mod; transportation of extracted material to the existing quarry for processing; landscaping and | This quarry project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | restoration of the site upon completion of works and all associated ancillary facilities. the applicant is seeking a 10 year permission | |
| 21708 | BP Mitchell haulage & Plant Hire Ltd. | Continued use and operation of the existing limestone quarry (*c*. 3.97 ha) including wheelwash, settlement lagoons, portable office, workshop and all associated ancillary activities, permitted under plan reg. ref. no. 02/1931 and 08/1563; installtion of a packaged wastewater treatment system and polishing filter | This project has been subject to the Appropriate Assessment process which concluded:<br>*'This screening report, based on the available information and project details, demonstrates beyond all reasonable scientific doubt that the proposed continuance of use of the quarry at Mulafarry will not result in likely significant effects on Natura 2000 sites.'*<br>This quarry project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 2012 | Killala Community Windfarm Designated Activity Company | 25 year permission for an energy storage facility . the development will comprise of a compound containing 4 energy storage containers with a capacity of up to 15 mv and associated transformers, switchgear, a primary metering cabinet, an auxiliary transformer unit, electrical cable ducting of approx 112 m and communications cable ducting of approx 124 m to connect to the existing 38 kv substation on the killala community wind farm site and all ancillary development. | This project has been subject to the Appropriate Assessment process which concluded:<br>*'It can be concluded beyond scientific doubt, in view of best scientific knowledge, and on the basis of objective information that the proposed Development of a battery storage facility at Killala Wind farm will not have a significant effect on any European Site. Therefore, an Appropriate Assessment Stage II (Natura Impact Statement (NIS)) is not required.'*<br>This energy storage project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 18358 | SSE Renewables (Ireland) Ltd. | A battery storage facility within a total site area of up to 1.18 ha, to include 55 self contained battery container units with associated hvac cooling units, 15 converter and 15 set up transformer container units, associated compound cabling and ducting, a grid transformer, a single storey substation/control | This project has been subject to the Appropriate Assessment process which concluded:<br>*'It has been objectively concluded during the screening process that the seven Natura 2000 sites within 15km of the proposal, listed below, are not likely to be significantly impacted by the proposed development, either alone or when considered with other projects or plans.'* |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | building with welfare facilities, a cable route grid connection to the existing esb substation building. | This energy storage project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 2560108 | SSE Renewables (Ireland) Ltd. | The development will consist of the following elements: • Battery Energy Storage System facility, consisting of battery containers with integrated HVAC (Heating, Ventilation, Air Conditioning) units, transformers, inverters, underground cabling, associated control rooms, internal access routes, lighting, CCTV, lightning masts, fencing; | This project has been subject to the Appropriate Assessment process which concluded:<br>*'It is concluded, on the basis of objective information, that the construction and/or operation of the proposed Mullafarry BESS at the existing SSE Thermal Tawnaghmore Power Generating Station, individually or in-combination with other plans or projects, will not have a significant effect on the aforementioned Natura 2000 sites, in view of the sites' conservation objectives, and can therefore be screened out or excluded from further consideration and Stage 2 Appropriate Assessment is not required in relation to the proposal described in this report.'*<br>This energy storage project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 2360134 | Mayo Renewable Limited | A nominal 50 megawatt electricity generating station, combusting woody biomass chips (domestic and imported) as well as a small proportion of fuel oil for boiler start-up. | This project has been subject to a Natura Impact Statement which concluded:<br>*'It is the conclusion of this NIS, on the basis of the best scientific knowledge available, and with the implementation of the mitigation and restriction measures set out, that the possibility of any adverse effects on the integrity of the European Sites considered in this NIS (having regard to their conservation objectives), or on the integrity of any other European Sites (having regard to their conservation objectives), arising from the proposed development, either alone or in combination with other plans or projects, can be excluded beyond reasonable scientific doubt.'*<br>This energy project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 2360266 | Constant Energy | The Proposed Development will consist of a Hydrogen Plant and an Energy Centre. The Hydrogen | This project has been subject to a Natura Impact Statement which concluded: |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | Plant, to the south of the site ,will consist of a Double Storey Electrolyser Building of up to 24 m height; Fin Fan Coolers of up to 10.5 m height; Hydrogen Storage Area of 7 m height; Hydrogen Gas Tube Filling Station of up to 9 m height, Gas Injection Compound and Gas Above Ground Installation Building of 4m height; Electrical Substation up to 15 m height and Ancillary Equipment Building of up to 3 m height; Fire Water Tank of up to 14 m height; Pump House of up to 5 m height; Administration/welfare building and control block building of up to 4 m height. | *'Based upon the information provided in this NIS, it is the considered view of its authors that it can be concluded by Mayo County Council that the Proposed Development, alone or in combination with other plans or projects, will not result in significant adverse effects to the integrity and conservation status of European Sites in view of their Conservation Objectives and on the basis of best scientific evidence, and there is no reasonable scientific doubt as to that conclusion.'*<br>This energy project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 2460699 | Schutz Ireland ltd. | The proposed development will consist of the following works: (a) Demolition of part of existing adjoining building to make provision for future extension as part of this application. (b) Demolition of temporary prefabricated buildings. (c) Construction of a fully serviced extension to side of existing building which will create additional production area for the existing facility, external plant mezzanine area and the construction of a two-storey office / admin block to the front of the development. (d) Alterations to elevations of existing building to include new wall cladding and windows. (e) New vehicular entrance off the existing service road to allow for HGV access to the rear of the site. (f) Site works to consist of alterations to existing service road, car parking, EV charging spaces, landscaping, lighting, the provision of a bicycle shelter, smoking shelter, covered outdoor seating area, forklift and gas compound, flag poles, signage and boundary treatments to the site. | This project has been subject to a Natura Impact Statement which concluded:<br>*'In light of the above, it is considered that with the implementation of the mitigation measures, that the proposed works do not have the potential to significantly affect the conservation objectives or qualifying interests of the Killala Bay / Moy Estuary SAC and SPA. The integrity of the site will not be adversely affected. Table 10 follows the integrity of the SAC / SPA checklist, which shows that the integrity of the site would not be affected by the proposed development.'*<br>This Killala Business Park project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| 2460295 | Schutz (Ireland) Ltd. | Planning permission sought for (1) Installation of 2 proposed bulk storage silos (13.1 m high) to the rear of existing building with all associated siteworks, (2) Alterations to site boundaries, (3) Retention of detached temporary prefabrication office ancillary building. (4) Retention of existing temporary smoking shelter and (5) Retention of relocation of previously approved storage container and retention of 1 additional storage container at Killala Business Park, Tawnaghmore Lower, Killala Co.Mayo. | This Killala Business Park project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 22562 | Aqua Comms (Ireland) Ltd. | Erection of a one-storey extension to existing cable landing station, proposed ESB substation and all associated site works. | This substation project has no direct or indirect connectivity to the Proposed Development. As there is no connecting pathway between the two projects there is no potential for in-combination effects on any European site. |
| 2460701 | Stephen Hannick | Planning Permission for Development consisting of construction of a storage shed & new slatted shed and underground slurry storage tank along with all associated site works. There will be two buildings and all effluent will be collected and stored in the proposed/existing slatted tanks. The slatted shed will be 7.067m in height and the storage shed will be 6.910m in height they are to be constructed in an existing farmyard our clients family have been farming in for years. | This farm project will have no impacts on any European site due to lack of any potential connecting pathway. As such this farm project cannot act in-combination with the Proposed Development to affect any European site. |
| 22757 | Lorcan Brennan | Filling of approximately 15,000 square metres of existing land by the importation of construction and demolition waste material to an average depth of 2m, level and reseed the site on completion of the fill, together with all associated site works. | This project has been subject to the Appropriate Assessment process which concluded:<br>*'It is of the opinion of the author that an AA of the proposed development is not required as it can be excluded, on the basis of objective information provided in this report, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European sites.'* |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | | This landfilling project has ben subject to the AA process and no significant effects on any European sites is predicted. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 2560595 | Conor Ruane | Planning permission for raising an area of land approximately 19300 sqm with inert material, to be filled no higher than 2 m to complete reclamation of field, level and reseed fields along with all associated sites works. | This project has been subject to the Appropriate Assessment process which concluded:<br>*'There are no direct connections to the Killala Bay / Moy Estuary SAC or SPA. The development site is not directly or indirectly connected to the River Moy fresh waters. There is no reasonable or realistic scientific evidence or data indicating that the proposed project will significantly impact on any Natura sites SCI's, QIH's, QIS or conservation objectives either alone or in combination with any other plan or project.'*<br>This landfilling project has no connecting pathway to any European sites. As such the two projects cannot ac in-combination with each other to give rise to effects on any European site. |
| 22652 | Martin Carey | Relocation of existing access 380 m to the north onto R314 Ballina/Killala road including all other ancillary site work and services | This small scale access road project will have no effect on any European sites given its location and lack of any connecting pathways. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 2560027 | Noreen Hackett | Full planning permission for a proposed steel framed commercial unit, together with on-site parking, wastewater treatment system and connection to existing public services to include all associated site works. A Natura Impact Statement will be submitted to the planning authority with the application. | This project has been subject to a Natura Impact Statement which concluded:<br>*'…it is deemed that with the implementation of the mitigation measures, that the proposed works do not have the potential to significantly affect the conservation objectives or qualifying interests of the Killala Bay/ Moy Estuary SAC, Killala Bay / Moy Estuary SPA and River Moy SAC or any other Natura 2000 site.'*<br>This commercial unit development employs surface water mitigation measures to ensure the development will not result in effects to downstream European sites and no significant effects are not anticipated. The Proposed Development, with the |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | | inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 2560391 | Siobhan Henry & Declan Kiely | Construction of a new two storey detached dwelling house and domestic garage, together with connection to public services and all associated site works at Old French Road, Farrannoo Td., Ballina, Co. Mayo. | This project has been subject to the Appropriate Assessment process which concluded:<br>*'Appropriate Assessment is not required as there will be no significant negative impacts either directly or indirectly on the Natura site with respect to the conservation objectives, SCI's or qualifying interest species / habitats either during construction or with subsequent habitation. No project specific mitigation measures are required to ensure that there are no significant direct or indirect impacts on the Natura sites conservation objectives or qualifying habitats or species.'*<br>This housing development project will have no effect on any European site. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 19393 | Holgrove Ltd. | Construct a new single storey rear extension to the northern most courtyard building (Jack Feen cafe) that is part of a complex adjacent to Belleek Castle a protected structure. the extension is to be used to extend the cafe's kitchen and for a museum connected to the cafe, remove stone retaining wall and construct a new retaining wall on the north side of the courtyard building, replace front window of cafe with a servicing window and carry out ancillary site works | This project has been subject to the Appropriate Assessment process which concluded:<br>*'Appropriate Assessment is not required as there would be no significant impacts, either directly or indirectly, on the identified Natura sites with respect to annexed habitat and / or annexed species either during construction or subsequent use. No specific mitigation measures or compensation measures are required to ensure that there are no direct or indirect impacts on the Natura sites habitats or species.'*<br>This building extension project will have no effect on any European site. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 2253 | Ballina Rugby | Redevelopment and extension of existing carpark, to include improved gradients, public lighting and access | This car park project will have no effect on any European site given its scale and location. The Proposed Development, with the inclusion of prescribed mitigation |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | Football Club. | to clubhouse facilities. to construct new retaining wall and associated works to facilitate carpark upgrade, to increase the width of existing vehicular access gate onto public road and construct new gate piers, carry out all ancillary site works | measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 211376 | IDA Ireland | Construction of a new access junction onto the N59 including the provision of road markings to facilitate a right turn ghost island junction, an internal access road of approx. 340 m length of 7.0 m wide carriageway, internal junctions, verges, footpaths, site services and all associated siteworks within the 8.66 hectare site. the application is accompanied by a nis | This project has been subject to a Natura Impact Statement which concluded:<br>*'This NIS has provided an assessment of all potential direct or indirect pathways for adverse effects on the QI habitats and species of Killala Bay/ Moy Estuary SAC (000458) or the Wetland SCI habitats of Killala Bay/Moy Estuary SPA (004036).*<br>*Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction and operation of the proposed development does not adversely affect the integrity of European sites.'*<br>This IDA development employs mitigation measures to ensure the development will not result in effects to downstream European sites and no significant effects are not anticipated. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 20646 | Joseph Corcoran | Filling of land with inert soil and subsoil, approximate area of 12000 sqm to an average depth of 1.2 m. level and reseed the site on completion of the fill. carry out all ancillary site works. | This project has been subject to the Appropriate Assessment process which concluded:<br>*'Appropriate Assessment is not required as there would be no significant impacts either directly or indirectly on the identified Natura site with respect to annexed habitat and / or annexed species either during filling or subsequent landscaping. No specific mitigation measures or compensation measures are required to ensure that there are no direct or indirect impacts on the Natura sites habitats or species.'* |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | | | This land filling project has no connectivity with the Proposed Development. As there is no connecting pathway there is no potential for any in-combination effects to any European site. |
| 2460315 | Paul Hanley | Planning permission for the following: (1) filling of land with inert soil & stones and mixtures of inert concrete, bricks, tiles & ceramics, to an approximate area of 12,000 $m^2$, with an average depth of 1.5 m, (2) level and reseed the site on completion of the fill and, (3) carry out all ancillary site works at Ballyholan Td., Ballina, Co. Mayo. | This project has been subject to the Appropriate Assessment process which concluded:<br>*'There is no reasonable or realistic scientific evidence or data indicating that the proposed project will significantly impact on any Natura sites SCI's, QIH's, QIS or conservation objectives either alone or in combination with any other plan or project.'*<br>This land filling project has no connectivity with the Proposed Development. As there is no connecting pathway there is no potential for any in-combination effects to any European site. |
| 2360261 | EirGrid PLC | The proposed development will consist of: (i) The replacement ("restringing") of the existing overhead line circuit conductor wires with a new higher capacity conductor including installation of a new fibre communication connection. (ii) The replacement of 20 of the 63 existing Intermediate Polesets (IMPs) with similar polesets. | This project has been subject to a Natura Impact Statement which concluded:<br>*'Following a comprehensive evaluation of the potential direct, indirect and cumulative impacts on the QI's of the aforementioned SACs and SPAs and the implementation of the proposed mitigation measures, it has been concluded by the authors of this report that there will be no adverse effects on the integrity any European site either alone or in-combination with other plans and projects.'*<br>This EirGrid project employs mitigation measures to ensure the project will not result in effects to downstream European sites and no significant effects are not anticipated. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 2460330 | Emmet O'Connor, Principal On behalf of Board of Management of St | Erect an extension to the existing school building (335.27 sq. m). the extension will consist of; 2 Classrooms, Multi activity room, Office, Store room, Sanitary accommodation and ancillary corridors, together with all associated alterations to the existing school building, including all associated site works | As competent authority, mayo County Council have made a determination in regard to AA, as follows:<br>*'The Planning Authority considers that due to its location at considerable distance outside of any designated European Site(s) and the information submitted on file, that the proposed development, by itself or in combination with other development* |

| Planning Ref. | Project /Applicant | Project Summary | In-combination Assessment |
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| | Joseph's National School | | *in the vicinity, would not be likely to have a significant effect on European site(s). Therefore, a Stage 2 Full Appropriate Assessment is not required.'*<br>This school extension project will have no effect on any European site given its location and scale. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 2460631 | Bonniconlon Youth Hub Community Group | Planning permission to construct an Astro Turf Pitch and walking track. Permission to include associated access road, car park and pedestrian access, with associated lighting. Also to erect fencing, ball stop netting and floodlighting to the perimeter of the proposed pitch, with the lighting to the pitch mounted on four 10 m high columns, together with all associated site works at, Bunnyconnellan West Td, Bonniconlon, Ballina, Co. Mayo. | This project has been subject to a Natura Impact Statement which concluded:<br>*'It is considered that following mitigation, that the proposed project does not have the potential to significantly affect the conservation objectives of these aforementioned Natura 2000 sites and the integrity of these sites as a whole will not be adversely impacted.'*<br>This community project will have no effect on any European site given its location and scale. The Proposed Development, with the inclusion of prescribed mitigation measures, will similarly have no significant effect on any European site. As such the two projects will not give rise to any in-combination effects. |
| 21881 | H-Gen Renewables Ltd. | Construction of a wind turbine with an operation lifespan of 30 years, from commissioning consisting of one wind turbine with a tip height of approximately 150 m, control building, new access road (approx. 240 m), hardstand areas, underground cabling and all associated site works | This project has been subject to the Appropriate Assessment process which concluded:<br>*'This Screening has resulted in a Finding of No Significant Effects and as such a Stage II Appropriate Assessment is not required.'*<br>This single wind turbine project site has no connectivity with the Proposed Development. As there is no connecting pathway there is no potential for any in-combination effects to any European site. |
| 21581 | ESB Networks | Construction of a 36 m high lattice communication structure carrying dishes, antennae and associated equipment | This communication structure project site has no connectivity with the Proposed Development. As there is no connecting pathway there is no potential for any in-combination effects to any European site. |

# 9. Concluding Statement

This NIS contains information that the competent authority (An Coimisiún Pleanála) may consider in making their own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the proposed Ballina and Lough Talt Water Supply Upgrade development on the integrity of the relevant European sites.

The Proposed Development has been subject to an Appropriate Assessment Screening which determined that, in the absence of mitigation measures, the possibility of likely significant effects to River Moy SAC, Lough Conn and Lough Cullin SPA, Killala Bay/Moy Estuary SAC, Killala Bay/Moy Estuary SPA and Lough Hoe Bog SAC cannot be entirely ruled out.

The potential for significant effects arises due to both direct and indirect connectivity from the Proposed Development to the aforementioned European sites. Works at Wherrew RWI&PS are directly within River Moy SAC and Lough Conn and Lough Cullin SPA, and although approximately 85% of the pipeline associated with the Proposed Development follows existing roads, certain sections cross River Moy SAC and also cross watercourses which flow into River Moy SAC and/or Killala Bay/Moy Estuary SAC and SPA. In addition the proposed pipeline runs adjacent to Lough Hoe Bog SAC for approx. 4 km.

This NIS has examined the details of the proposed Ballina and Lough Talt Water Supply Upgrade development and the European sites with connecting pathways. It has analysed the potential impacts of the proposed works on the receiving natural environment and evaluated their effects, both individually and in-combination with other plans and projects, in view of the conservation objectives of the relevant European sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Habitats Regulations, relevant case law and guidance from the European Commission, the Department of the Environment, Heritage and Local Government and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

Given the prescription of the mitigation measures detailed in Section 7 of this NIS, it can be concluded beyond reasonable scientific doubt that the proposed Ballina and Lough Talt Water Supply Upgrade development will not, either individually or in-combination with other plans or projects, give rise to any impacts which would constitute adverse effects on River Moy SAC, Lough Conn and Lough Cullin SPA, Killala Bay/Moy Estuary SAC, Killala Bay/Moy Estuary SPA and Lough Hoe Bog SAC or any other European site, in view of their conservation objectives. Therefore, it is the recommendation of the authors of this report that An Coimisiún Pleanála , as the competent authority in this case, may determine that the Proposed Development, either individually or in-combination with other plans or projects, will not adversely affect the integrity of any European site, provided that the mitigation prescribed in this NIS is fully and properly implemented.

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# Appendix A. Breeding Bird Survey Report

# Wherrew Water Treatment Plant Intake

# (Lough Talt Replacement)



# Breeding Bird Survey 2024

## Prepared By:

Delichon Ecology

## Prepared For:

## AtkinsRéalis

# Wherrew Water Treatment Plant Intake (Lough Talt Replacement) Breeding Bird Survey 2024

| Revision | Dcoument Number | Description | Prepared by | Checked by | Date |
|---|---|---|---|---|---|
| Draft for Review | 17_2025 | Wherrew WTP Intake Breeding Bird Survey | ED | ED | 13/03/2025 |
| Final | 17_2025 | Wherrew WTP Intake Breeding Bird Survey | ED | ED | 14/03/2025 |
| | | | | | |

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# 1. Introduction

Delichon Ecology Ltd was commissioned by AtkinsRealis, to undertake a breeding bird survey for the proposed Wherrew Water Treatment Plant Intake in June 2024.

This study consisted of walkover surveys that incorporated line transect and Vantage Point surveys during the late breeding season 2024; i.e. mid and late June 2024. The surveys were undertaken to assess the presence, pattern of usage and current conservation status of breeding bird species found within and in the vicinity of the Wherrew Water Treatment Plant intake area **(See Figure 1-1** & **Figure 3-1).** These surveys were also used to evaluate the importance and potential ecological significance of the study area and its environs to support breeding avifauna.

## 1.1 Project Description

The proposed project will see increased raw water abstraction from Lough Conn in County Mayo at the existing Wherrew Raw Water Intake Site. Currently, two Water Treatment Plants (WTPs) – Wherrew and Lisglennon - are supplied with raw water which is pumped from the existing intake on the northern shore of Lough Conn. The proposed project would involve increasing the current raw water abstraction from Lough Conn (c. 13,400$m^3$/day) by an estimated additional volume of 15,200m3/day, to serve Lough Talt RWSS along with forecast future demand in the Ballina RWSS area. The existing intake structure and pump station are proposed to be retained, with upgrades to be completed to improve operational performance.

Abstracted water will then be pumped via an existing trunk main northwards for c. 11km to a raw water balancing and storage tanks, south of the existing Lisglennon WTP site. Raw water will then be pumped via 1km of upgraded mains to the existing Lisglennon WTP site. Upgrades to existing pumping apparatus at the Lisglennon Raw Water Storage and Pump Station site will be required.

As part of the proposed project, expansion of water treatment capacity will be required at the Lisglennon WTP site, inclusive of all associated process infrastructure in addition to a new storage reservoir at the site.

An upgraded treated water trunk main network (c. 30.4km length) will be required between the Lisglennon WTP and Lough Talt WTP sites, via Ballina town. Treated water will gravitate to Ballina and onwards towards Bunnyconnellan.

A new booster pumping station will be required near Bunnyconnellan, from where water will then be pumped to a new storage reservoir near the existing Lough Talt WTP site. Treated water will then gravitate into the existing Lough Talt RWSS network.

Decommissioning works will be carried out at the existing Lough Talt WTP site, which upon delivery of the proposed project, will cease abstraction and treatment of water from Lough Talt.

Renewable energy generation equipment (solar panels and energy recovery turbines) is proposed to be installed as part of the works at all new and upgraded sites.

The proposed project will also necessitate a new Water Abstraction License from the EPA for the Wherrew WTP at Lough Conn.

**Figure 1-2** below illustrates the alignment of the existing and proposed pipelines, existing treatment plants and pumping stations and the indicative locations of the new reservoirs and pumping station.

## 1.2 Aims of the Proposed Survey

- To record quantitative spatial data on breeding birds within the footprint, environs and Zone of Influence of the Wherrew WTP intake area.

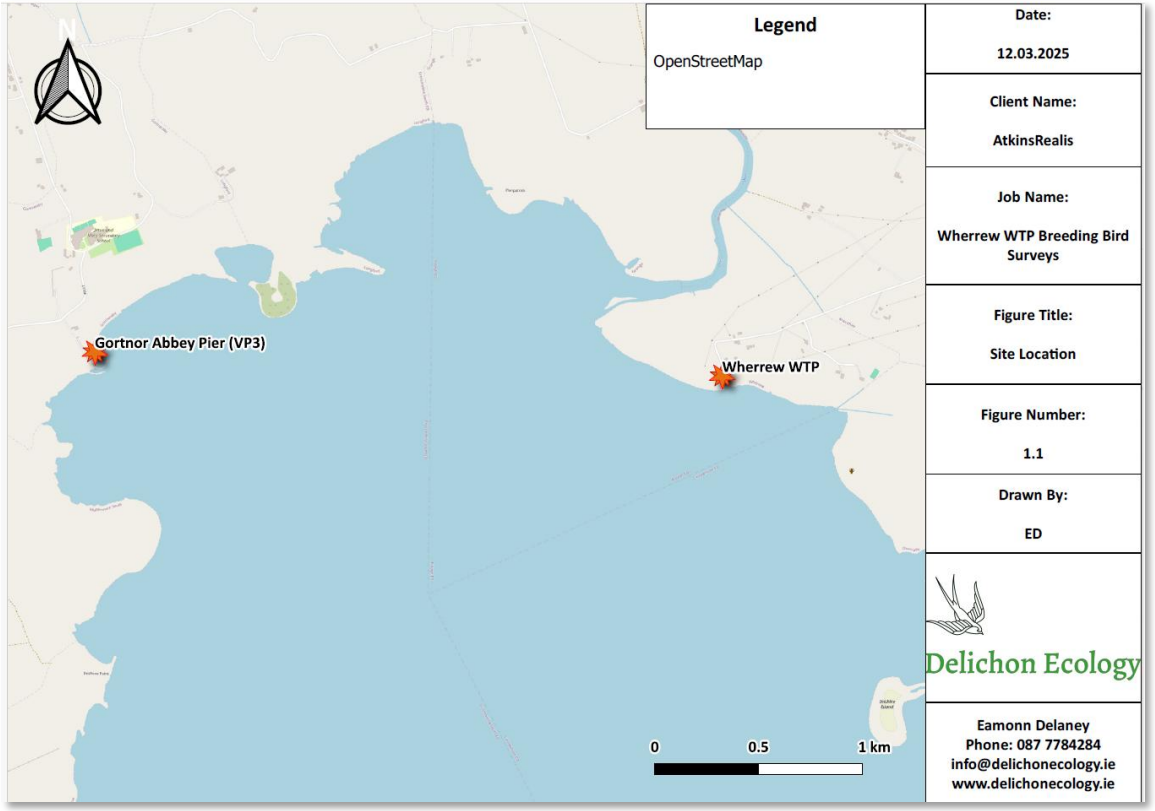



**Figure 1-1 - Study area**

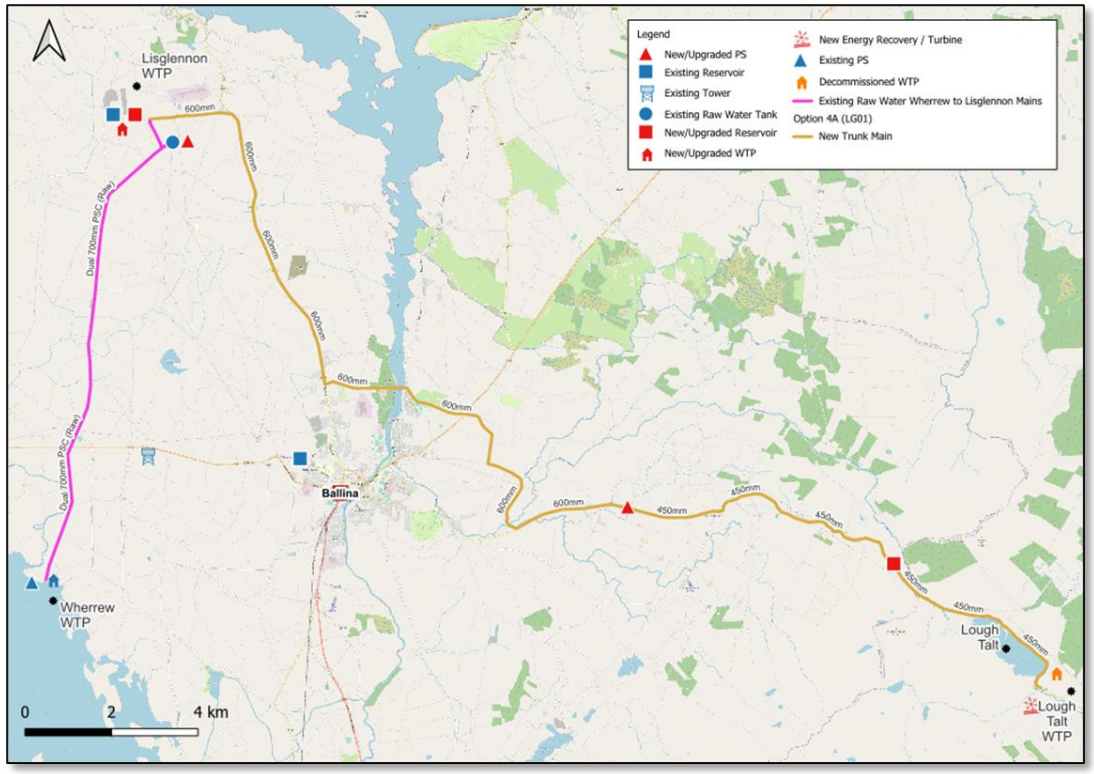



**Figure 1-2 - Alignment of the existing and proposed pipelines, existing treatment plants and pumping stations and the indicative locations of the new reservoirs and pumping station**

# 2 Methodology

### 2.1.1 Bird Surveys

Bird Survey methodology undertaken for the Wherrew WTP intake area and environs included two line transects and three Vantage Point surveys.

The line transect surveys were conducted in accordance with the methodology described by Bibby *et al.* (2000) and the Countryside Bird Survey Manual - Guidelines for Countryside Bird Survey participants (BirdWatch Ireland, 2012). Two survey visits were conducted; to identify and determine the occurrence and abundance of resident and migratory breeding bird species within the study area. These surveys were completed during suitable weather conditions (Bibby *et al*. 2000).

Three Vantage Points (VPs) were selected to cover the adjoining areas of the existing WTP intake and to cover the northernmost shoreline and bay areas of Lough Conn. All target species (Annex 1 listed, red and moderate species of conservation concern) were recorded in addition to commoner species potentially sensitive to development. Details recorded included flightlines mapped, flight duration, direction and heights.

Survey dates, survey times and conditions are provided in **Table 2.1** below.

The study area extent is presented in **Figure 3.1** below.

**Table 2-1 - Breeding bird survey dates**

| Survey Date and Period | Survey Time (Extent) | Survey Conditions | Survey Effort |
|---|---|---|---|
| **June 12th 2024** | **09:11 – 12.45**<br>Transect 1 – 09.11 – 09.27<br>Transect 2 – 11.01 – 11.14<br>VP 1 09.39 – 10.09<br>VP2 10.24 – 10.54<br>VP3 12.15 – 12.45 | No rainfall. Clear skies with moderate temperatures.<br>Good to Excellent visibility, Octas 1/8 - 4/8. Windspeed BF 0-1 S / SW. | Breeding Bird survey – line transect surveys and scan / overview of adjacent areas.<br><br>VP Survey at three locations |
| **June 28th 2024** | **07.37 –**<br>Transect 1 – 07.37 – 07.54<br>Transect 2 – 09.17 – 09.30<br>VP 1 08.45 – 09.15<br>VP2 08.01 – 08.31<br>VP3 09.33 – 10.03 | Overcast, dry (no rain) with moderate temperatures.<br>Excellent visibility, Octas 8/8. Windspeed BF 0-1N BF1-2W. | Breeding Bird survey – line transect surveys and scan / overview of adjacent areas.<br><br>VP Survey at three locations |

All bird species encountered (seen or heard) during the surveys were recorded, together with the abundance of each species. Birds flying over the site were also included as part of the observations. Casual records of birds encountered during the spot counts and field walkovers, but outside of dedicated survey period were also noted.

### 2.1.2 Conservation Status of Bird Species

The conservation status of bird species recorded during the transect surveys and scoping exercise was assessed with reference to the EU Birds Directive (2009/147/EC) Annex I list and Birds of Conservation Concern in Ireland (BoCCI), (Gilbert & Lewis, 2021)[1]. For the BoCCI list, Red-listed species are of high conservation concern in Ireland, Amber-listed species are considered of medium conservation concern, while Green-listed species are not of conservation concern in Ireland at present. Bird species listed on Annex I of the EU Birds Directive have been identified as requiring special conservation measures in relation to their habitats and have been listed due to risk of extinction; vulnerability to specific changes in their habitat and due to their relatively small population size or restricted distribution. The numbers of birds along each transect was recorded and breeding evidence / behaviour of the birds identified were recorded in accordance with the breeding status codes outlined by the British Trust for Ornithology (BTO). The BTO Breeding Status Codes are presented in **Appendix B**.

### 2.1.3 Zone of Influence

The current guidance on ecological assessments (CIEEM, 2018)[2] recommends that all ecological features that occur within a 'Zone of Influence' (Zol) for a proposed development are investigated.

The Zol for the breeding bird surveys includes:

- areas directly within the proposed project;
- areas adjoining and in proximity to the proposed project providing suitable breeding avifaunal habitat;
- areas adjoining the proposed project subject to indirect impacts (such as disturbance impacts) from the proposed works;
- areas which will be temporarily affected during construction;
- areas likely to be impacted by hydrological disruption; and
- areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The ZoI is variable depending on the ecological receptors affected. Given the extent of the proposed works study area (**Figure 3.1**), in this case the ZoI is the footprint of the proposed works footprint and immediately adjoining and surrounding lands.

[1] Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

[2] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, Version 1.2 Updated April 2022. Chartered Institute of Ecology and Environmental Management, Winchester

# 3 Results

## 3.1 Birds in the Existing Environment

The species assemblage recorded during the breeding bird surveys was typical for the range of habitats present within the study area and its environs. Abundances of breeding avifauna using the study area and its environs were low and restricted to individuals or small flocks. The adjoining areas of the Lough Conn waterbody did not support great abundances of aquatic or avifauna, rather individuals or small flocks of birds overflying the waterbody or associated with adjoining areas of scrub and wet woodland adjoining the lakeshore. Bird species identified using the nearby areas of Lough Conn during the surveys for feeding and foraging purposes included Grey Heron, Common Sandpiper, Sand Martin, Swallow, Grey Wagtail. Lesser Black-backed Gull, Common Gull and Black-backed Gull, Mallard and Common Tern were also identified foraging over the Lough Conn waterbody and margins. Individual Swift were also identified foraging over Lough Conn shoreline area.

The wider terrestrial margins of the surveyed transects supported evidence of resident breeding passerine species including Wren, Robin, Song Thrush, Blackbird, Blue Tit, Chaffinch and Dunnock. These were typically associated with fringing pastoral areas and linear woodland habitats.

Migratory passerine species identified within the survey area included Willow Warbler, Blackcap, House Martin, Swallow and Swift. Willow Warbler and Blackcap were typically associated with scrub cover adjoining Lough Conn. House Martin, Swallow and Swift were seen foraging over the Lough Conn waterbody.

Sustained Common Sandpiper breeding activity was noted (distraction efforts by male bird, territorial behaviour) along the westernmost end of Transect 1. This is a migrant species commonly associated breeding along rocky lakeshore habitat.

A brief analysis of each transect is provided below. The findings of the breeding bird survey results from 2024 is presented in full in **Table 3.1** below.

### 3.1.1 Survey Results 2024

**Line Transect 1 –** This transect was located along the north-eastern margins of Lough Conn, running south-east and south of Wherrew WTP. This transect was located along the lakeshore habitats of Lough Conn which included exposed rocky shoreline, seasonally inundated semi-natural grassland and adjoining areas of scrub and wet woodland. Most breeding bird activity associated with this transect was associated with birds occurring on, or flying over, the adjoining areas of Lough Conn; i.e. Mallard, Sand Martin, Grey Heron, Cormorant, Lesser Black-backed Gull and Common Tern. The exposed rocky shoreline of Lough Conn supported evidence of breeding Common Sandpiper immediately south-east of the current WTP intake. The adjoining scrub and young woodland habitat supported evidence of breeding passerine species (mostly singing males), both resident and migratory including Reed Bunting, Chaffinch, Willow Warbler and Blackcap.

**Line Transect 2** – This transect was located along the north-eastern margins of Lough Conn, running north-west and north of Wherrew WTP intake. This transect was located along the lakeshore habitats of Lough Conn which included seasonally exposed rocky shoreline and adjoining areas of scrub and wet woodland. The adjoining scrub and woodland habitat supported evidence of breeding passerine

species, both resident and migratory including Spotted Flycatcher, Chaffinch, Willow Warbler and Blackcap. The rocky shoreline areas supported Grey Wagtail, a red listed riverine / lakeshore breeding bird species.

**Vantage Point 1 –** Vantage Point 1 was located at the northernmost point of Transect 2. This Vantage Point covers the north-eastern shores of Lough Conn and the adjoining bay area. Breeding bird abundance and activity was low with individual occurrences and small flocks of Lesser Black-backed Gull, Black-headed Gull, Common Gull, Mallard and Cormorant.

**Vantage Point 2 –** Vantage Point 2 was located at the southernmost point of Transect 1. This Vantage Point covers the eastern shores of Lough Conn and the adjoining eastern bay area. Breeding bird abundance and activity was low with individual occurrences and small flocks of Lesser Black-backed Gull, Black-headed Gull, Common Gull and Cormorant over flying the lake and foraging nearby.

**Vantage Point 3** – This VP was sited at the pier south of Gortnor Abbey. This Vantage Point covers the north-western shores of Lough Conn and the adjoining eastern bay area. Breeding bird abundance and activity was low with individual occurrences and small flocks of Lesser Black-backed Gull, Cormorant, Mute Swan and Mallard.

A breakdown of the breeding avifauna recorded in June 2024 is presented in **Table 3.1** below.

**Table 3-1 – Line Transect Breeding Bird Survey Results June 2024[3]**

| Species Name[4] | Transect 1[5] | Transect 2 |
|---|---|---|
| **June 12th 2024** | | |
| House Sparrow (*Passer domesticus*) | 1 (S) | |
| Willow Warbler (*Phylloscopus trochilus*) | 3 (H,S) | |
| Mallard (*Anas platyrhynchos*) | 1(F) | 7(P) |
| Pied Wagtail (*Motacilla alba yarrelli*) | 1 (H) | 1(H) |
| Common Sandpiper (*Actitis hypoleucos*) | 4 (H,A) | |
| Sand Martin (*Riparia riparia*) | 8 (H) | 1(H) |
| Reed Bunting (*Emberiza schoeniclus*) | 1 (H) | |
| Grey Heron (*Ardea cinerea*) | 1(F) | |
| Cormorant (*Phalacrocorax carbo*) | 1 (H) | |

[3] Numbers presented in the table relate to the numbers of birds identified during the bird surveys.
[4] Conservation status assigned by 'traffic light' system of colour coding, in accordance with the Birds of Conservation Concern in Ireland (Gilbert *et al*., 2021).
[5] Numbers of birds identified along each transect are presented in this table. In addition, the British Trust for Ornithology Breeding Status Codes are also included for each species identified. S - Singing male present (or breeding calls heard) in breeding season in suitable breeding habitat ; H - Species observed in breeding season in suitable nesting Habitat; F - Flying over; U - Species observed but suspected to be sUmmering non-breeder; A - Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby

| Species Name[4] | Transect 1[5] | Transect 2 |
|---|---|---|
| Lesser Black-backed Gull (*Larus fuscus*) | 1 (F) | |
| Blackcap (*Sylvia atricapilla*) | | 2 (S) |
| Spotted Flycatcher (*Muscicapa striata*) | | 1 (S) |
| Chaffinch (*Fringilla coelebs*) | | 2 |
| **June 28th 2024** | | |
| Common Sandpiper (*Actitis hypoleucos*) | 3 (H,A) | |
| Common Gull (*Larus canus*) | 2 (F) | |
| Blackcap (*Sylvia atricapilla*) | 1 (S) | 1 (S) |
| Sand Marin (*Riparia riparia*) | 6 (F) | |
| Wren (*Troglodytes troglodytes*) | 1 (S) | 2 (S) |
| Grey Heron (*Ardea cinerea*) | 1 (H) | |
| Lesser Black-backed Gull (*Larus fuscus*) | 3(F) | 1 |
| Cormorant (*Phalacrocorax carbo*) | 1(F) | |
| Willow Warbler (*Phylloscopus trochilus*) | 1 (S) | |
| Chaffinch (*Fingilla coelebs*) | 1 (S) | 1 (S) |

| Species Name[4] | Transect 1[5] | Transect 2 |
|---|---|---|
| Linnet (*Linaria cannabina*) | 2 (S) | |
| Meadow Pipit (*Anthus pratensis*) | 3 (H, A) | |
| Mallard (*Anas platyrhynchos*) | 1(F) | |
| Common Tern (*Sterna hirundo*) | 1 (F) | |
| Swallow (*Hirundo rustica*) | 2 (F) | 1 (F) |
| Grey Wagtail (*Motacilla cinerea*) | | 1 (H, A) |

**Table 3-2 – Vantage Point Breeding Bird Survey Results June 2024**

| Species Name[6] | Vantage Point 1<br>Lough Conn[7] | Vantage Point 2<br>Lough Conn[8] | Vantage Point 3<br>Gortnor Abbey[9] |
|---|---|---|---|
| **12.06.2024** | | | |
| Common Tern (*Sterna hirundo*) | 1 | | |
| Black-headed Gull (*Larus ridibundus*) | 1 | 1 | |
| Common Gull (*Larus canus*) | 1 | 1 | |
| Lesser Black-backed Gull (*Larus fucus*) | 1 | 2 | 1 |
| Mallard (*Anas platyrhynchos*) | 5 | | |
| Cormorant (*Phalacrocorax carbo*) | 1 | 1 | 1 |
| Mute Swan (*Cygnus olor*) | | | 1 |
| **28.06.2024** | | | |

[6] Conservation status assigned by 'traffic light' system of colour coding, in accordance with the Birds of Conservation Concern in Ireland (Gilbert *et al*., 2021).
[7] Other non-target species identified during the survey include: Willow Warbler, Blackcap, Pied Wagtail, Swallow, Chaffinch, Sand Martin, Reed Bunting, House Martin, Wren
[8] Other non-target species identified during the survey include: Willow Warbler, Blackbird, Lapwing heard east of VP, not seen; Little Egret, Meadow Pipit, Blackcap, Reed Bunting, Whitethroat and Chaffinch.
[9] Other non-target species identified during the survey include: Pied Wagtail, Willow Warbler, Wren, Swallow, House Martin, Whitethroat, Hooded Crow, Woodpigeon, Chaffinch, Hooded Crow, Sand Martin.

| Species Name[6] | Vantage Point 1<br>Lough Conn[7] | Vantage Point 2<br>Lough Conn[8] | Vantage Point 3<br>Gortnor Abbey[9] |
|---|---|---|---|
| Common Tern (*Sterna hirundo*) | | 1 | |
| Common Gull (Larus canus) | | 5 | |
| Lesser Black-backed Gull (*Larus fuscus*) | | 2 | 2 |
| Swift (*Apus apus*) | | 1 | 1 |
| Common Sandpiper (*Actitis hypoleucos*) | 1 | | |
| Mallard (*Anas platyrhynchos*) | | | 2 |

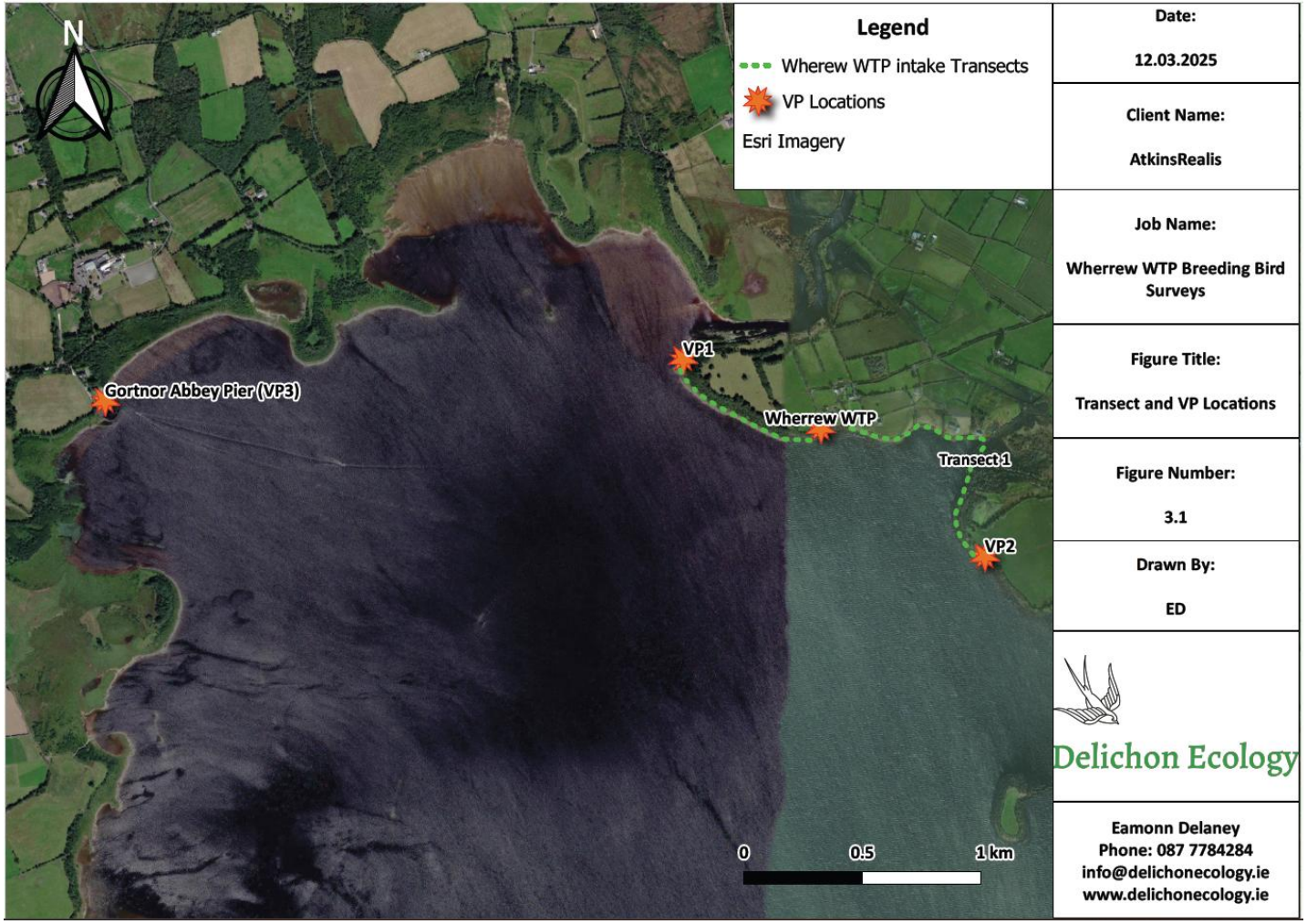



**Figure 3-1 - Bird Survey Locations**

## 3.2 Summary

The study area is characterised by the Lough Conn waterbody and its adjoining lakeshore habitats. The findings of the breeding bird surveys undertaken in June 2024 found that the main body of Lough Conn supported very low breeding bird abundance and activity. This may be due to the nature of the waterbody in this area, which supports a large expansive, deep lake waterbody and may not provide optimal feeding and foraging habitat for breeding bird species. Lough Conn is historically known to support breeding Common Scoter in addition to breeding Common Gull, Lesser Black-backed Gull and Common Tern colonies. No evidence of breeding habitat or lands supporting breeding colonies for these species was identified during the breeding bird surveys. Nonetheless, individual and small flocks of gull species and Common Tern were identified overflying the transect and vantage point locations. It is likely that gulls and tern species utilise the wider lake area to forage and for refuge throughout the breeding season.

The lake margins provide suitable breeding habitat for Grey Wagtail and Common Sandpiper and evidence of breeding activity was confirmed for both species along the exposed rocky shoreline during the transect surveys. Summer migrant species overflying the transect and Vantage Point locations for feeding and foraging purposes include Sand Martin, House Martin, Swallow and Swift. There is no suitable breeding habitat for these species within the study area footprint, but the lake and shoreline habitats provide suitable foraging habitat.

Typical migrant warbler species were identified within the study area. The areas of fringing lakeshore scrub and woodland supported migrant warbler species including Willow Warbler, Blackcap, and Whitethroat. Resident breeding bird species identified within these areas included Reed Bunting, Chaffinch, Wren and Linnet.

Raptor species were not identified during the breeding bird surveys. The survey area does not provide optimal habitat for nesting and breeding raptor species. However species such as Sparrowhawk, Kestrel, Peregrine and Buzzard are likely to use the survey area for foraging and hunting purposes.

Red listed species identified during the breeding bird surveys included Grey Wagtail, Meadow Pipit and Swift. All of these species were identified along the lakeshore fringes north and south of the existing WTP intake area. Both Grey Wagtail and Meadow Pipit were identified within suitable breeding habitat and exhibited probable breeding activity.

# 4 References

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# APPENDIX A – BTO BREEDING STATUS CODES

# Breeding Status Codes

| | |
|---|---|
| **Non-breeding** | |
| **F** | **F**lying over |
| **M** | Species observed but suspected to be still on **M**igration |
| **U** | Species observed but suspected to be s**U**mmering non-breeder |
| | |
| **Possible breeder** | |
| **H** | Species observed in breeding season in suitable nesting **H**abitat |
| **S** | **S**inging male present (or breeding calls heard) in breeding season in suitable breeding habitat |
| | |
| **Probable breeding** | |
| **P** | **P**air observed in suitable nesting habitat in breeding season |
| **T** | Permanent **T**erritory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more part at the same place or many individuals on one day |
| **D** | Courtship and **D**isplay (judged to be in or near potential breeding habitat; be cautious with wildfowl) |
| **N** | Visiting probable **N**est site |
| **A** | **A**gitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby |
| **I** | Brood patch on adult examined in the hand, suggesting **I**ncubation |
| **B** | Nest **B**uilding or excavating nest-hole |
| | |
| **Confirmed breeding** | |
| **DD** | **D**istraction-**D**isplay or injury feigning |
| **UN** | **U**sed **N**est or eggshells found (occupied or laid within period of survey) |
| **FL** | Recently **FL**edged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat. |
| **ON** | Adults entering or leaving nest-site in circumstances indicating **O**ccupied **N**est (including high nests or nest holes, the contents of which can not be seem) or adults seen incubating |
| **FF** | Adult carrying **F**aecal sac or **F**ood for young |
| **NE** | **N**est containing **E**ggs |
| **NY** | **N**est with **Y**oung seen or heard |

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