AtkinsRéalis

Environmental Impact Assessment Report (EIAR) Volume 2 – Chapter 21 – Mitigation and Monitoring Measures

Uisce Éireann
October 2026

BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

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This document has 93 pages including the cover.

Document history

Document title: Environmental Impact Assessment Report (EIAR) – Volume 2 - Chapter 21 - Mitigation and Monitoring Measures

Document reference: 0089328DG0054

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
0	Final	FE/ LH	LH	DE	DL	28/10/2026

Client signoff

Client	Uisce Éireann
Project	BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE
Job number	100089328

Client signature/date

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Abbreviations

Abbreviation	Meaning
ARC	Anti-Reflective Coating
BPS	Booster Pumping Station
BPT	Break Pressure Tank
BS	British Standard
C&D	Construction and Demolition
CEMP	Construction Environmental Management Plan
CEDS	Circular Economy Design Standards
CH	Cultural Heritage
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CO2	Carbon Dioxide
CTMP	Construction Traffic Management Plan
CWPTMP	Construction Works Preliminary Traffic Management Plan
DoAFM	Department of Agriculture, Food and Marine
DoHLGH	Department of Housing, Local Government and Heritage
DMP	Dust Management Plan
ECoW	Ecological Clerk of Works
EDEN	Environmental Data Exchange Network
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMS	Environmental Management System
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
EWC	European Waste Catalogue
FETAC	Further Education and Training Awards Council
GHG	Greenhouse Gas
GPP	Guidance for Pollution Prevention
GPR	Ground Penetrating Radar
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
IBC	Intermediate Bulk Container
IFI	Inland Fisheries Ireland
IR	Infrared
LCRM	Land Contamination and Risk Management
LED	Light Emitting Diode
LGV	Light Goods Vehicle
LoW	List of Waste
MV	Medium Voltage
LMP	Landscape Management Plan
NMS	National Monuments Service

Abbreviation	Meaning
INNS	Invasive Non-Native Species
NPWS	National Parks and Wildlife Services
NFQ	National Framework Qualification
NRA	National Roads Authority
NSL	Noise Sensitive Location
NWCPO	National Waste Collection Permit Office
OGV	Ordinary Goods Vehicle
PM10	Particulate Matter less than 10 micrometres
PPV	Peak Particle Velocity
PRoW	Public Rights of Way
PRV	Pressure Reducing Valves
PV	Photovoltaic
RAL	Reichs-Ausschuss fur Lieferbedingungen colour standard
RAP	Reclaimed Asphalt Pavement
RLB	Redline Boundary
RPS	Record of Protected Structures
RWMP	Resource and Waste Management Plan
RWI&PS	Raw Water Intake and Pumping Station
SAC	Special Area of Conservation
SPA	Special Protection Area
SSA	Site Safety Awareness
SuDS	Sustainable Drainage System
TII	Transport Infrastructure Ireland
TWA	Temporary Works Area
UÉ	Uisce Éireann
UV	Ultraviolet
VMS	Variable Message Sign
WH	Water and Hydrology
WMS	Waste Management Co-ordinator
WMP	Waste Management Plan
WSV	Water Supply Zone
WTP	Water Treatment Plant
ZoN	Zone of Notification

21. Summary of Mitigation and Monitoring Measures

Annex IV(7) of the 2014 EIA Directive (2014/52/EU) requires;

'A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant environmental adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.'

This chapter summaries the mitigation and monitoring measures identified in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) proposed to avoid, minimise and control potential adverse environmental effects associated with the Ballina and Lough Talt Water Supply Upgrade (hereafter referred to as the 'Proposed Development'). Where likely significant effects have been identified in the relevant chapters of the EIAR, measures have been proposed to reduce/eliminate these effects as much as possible. Residual effects, the effects remaining after mitigation measures have been put in place, are discussed in the relevant chapters.

All mitigation and monitoring measures relating to the pre-commencement, construction and operational phases of the Proposed Development are set out in the relevant chapters of this EIAR and are consolidated in the sections below. As stated in Chapter 3 – Project Description, 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.

From inception of the design of the Proposed Development, the design team has aimed to avoid, prevent and reduce adverse environmental effects which are incorporated into the design stage drawings and specifications of the Proposed Development.

All of the mitigation and monitoring measures detailed below have been incorporated into the Construction Environmental Management Plan (CEMP) (Appendix 3-3 of Volume 3 of the EIAR) submitted as part of this planning application. The CEMP will be updated by the Appointed Contractor, and will be a live document and will be further added to by the Appointed Contractor and to include any future additional mitigation measures as may be required.

21.1 General mitigation and monitoring measures

This section sets out general provisions for the mitigation and monitoring or environmental constraints incorporated into the design, and project-level plans and provisions to be complied with throughout construction phase (see Chapter 3 – Project Description).

Table 21-1 — General mitigation and monitoring measures

Section Reference	Description
3.3.4.1 Environmental Management	Environmental Management will be implemented via the CEMP. A CEMP has been submitted as Appendix 3-3 of this EIAR, 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);

Section Reference	Description
	▪ Environmental monitoring and assessments will be managed by the Environmental Manager. The Environmental Manager will be responsible for preparing monitoring reports for submission to Uisce Éireann. The Environmental Manager 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 be updated 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
3.4.1 Environmental Management	Given the sensitivity of the sites, it is proposed that an Environmental Manager, a Waste Management Coordinator (WMC) as well as a suitably qualified Ecological Clerk of Works (ECoW) will be retained by the Appointed Contractor. The 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.
3.3.1 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;

Section Reference	Description
	▪ 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.
3.3.4.2 Traffic Management	The Appointed Contractor will be required to prepare a Construction Traffic Management Plan (CMTP). 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. Please refer to Chapter 15 – Roads, Traffic and Transportation and the CWPTMP (Appendix 15-1, Volume 3 of the EIAR).
3.3.4.3 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.
3.3.4.4 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 as Appendix 7-1 of this EIAR, 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.
3.3.4.5 Resource and Waste Management	The construction of the Proposed Development will be in accordance with the RWMP produced by the Appointed Contractor in advance of the works, based on updated site information. The RWMP will provide a mechanism for monitoring and auditing waste management performance and compliance for the duration of construction works. A RWMP (RWMP) has been produced and submitted as Appendix 14-1, Volume 3 of this EIAR 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 preliminary stage, while also allowing for further enhancement as the Proposed Development progresses through

Section Reference	Description
	to the detailed design and construction stages. Further details are provided in Section 3.6. See also Chapter 14 – Resource and Waste Management.
3.3.4.6 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
3.3.5.1 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.
3.3.5.1 Abnormal loads	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.
3.3.6.1 Site Compounds and Temporary Working Areas: 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. ▪ 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.

Section Reference	Description
	▪ 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 EIAR and 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 EIAR. 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, the EIAR 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.
3.3.6.2 Site Compound and Temporary Working Area Locations	Indicative site compounds have been identified at Wherrew RWI&PS, Lisglennon RWS&PS and Lisglennon WTP, Bonniconlon BPS, Windy Gap BPT, Lough Talt Reservoir and Bonniconlon Reservoir. One further TWA has been identified on the R314 (adjacent to Laughtadawannagh). 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. Site locations are included in the CEMP.

<table>
<tr><th>Section Reference</th><th>Description</th></tr>
<tr><td>3.41 Construction noise</td><td>
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 21-2 and construction vibration in Table 21-3.

Table 21-2 — Recommended noise thresholds during construction works (from: TII, 2014).
<table>
<tr><th>Day</th><th>Working Hours</th><th>Level dB (LAeq,1hr)</th></tr>
<tr><td>Mon-Fri</td><td>07.00 – 19.00</td><td>70</td></tr>
<tr><td>Mon-Fri</td><td>19.00 – 22.00</td><td>60*</td></tr>
<tr><td>Saturday</td><td>08.00 – 16.30</td><td>65</td></tr>
<tr><td>Sundays & Bank Holidays</td><td>08.00 – 16.30</td><td>60*</td></tr>
</table>
* Construction activity at these times, other than emergency works, will normally require specific permission from the local authority.

Table 21-3 — Recommended vibration thresholds during construction works (from: TII, 2014).
<table>
<tr><th colspan="3">Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:</th></tr>
<tr><td><10Hz</td><td>10-50 Hz</td><td>50-100 Hz (and above)</td></tr>
<tr><td>8mm/s</td><td>12.5 mm/s</td><td>20 mm/s</td></tr>
</table>
A CEMP has been produced and submitted as Appendix 3-3, Volume 3 of this EIAR, 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

</td></tr>
</table>

<table>
<tr><th>Section Reference</th><th>Description</th></tr>
<tr><td></td><td>construction works. Noise monitoring will be carried out as per the requirements of ISO 1996</td></tr>
<tr><td>3.4.2 Operational noise</td><td>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 to vibration in buildings) for vibration. Stricter noise levels (LAF90) will be applied where an area is shown to have low background noise, as shown in Table 21-4. Vibration levels are shown in Table 21-5.

Table 21-4 — Operational Noise standards (from: EPA NG4)
<table>
<tr><th>Location</th><th>Day-time Noise Criterion, dB LAr,T (07:00 to 19:00 hrs)</th><th>Evening Noise Criterion, dB LAr,T (19:00 to 23:00 hrs)</th><th>Night-time Noise Criterion, dB LAeq,T (23:00 to 07:00 hrs)</th></tr>
<tr><td>Areas of Low Background Noise</td><td>45 dB</td><td>40 dB</td><td>35 dB</td></tr>
<tr><td>All other Areas</td><td>55 dB</td><td>50 dB</td><td>45 dB</td></tr>
</table>
Table 21-5 — Operational vibration standards for internal assessment (from: BS 6472-1:2008 – Guide to evaluation of human exposure to vibration in buildings)
<table>
<tr><th>Place and time</th><th>Low probability of adverse comment m·s-1.75</th><th>Adverse comment possible m·s-1.75</th><th>Adverse comment probable m·s-1.75</th></tr>
<tr><td>Residential buildings 16 h day</td><td>0.2 to 0.4</td><td>0.4 to 0.8</td><td>0.8 to 1.6</td></tr>
<tr><td>Residential buildings 8 h night</td><td>0.1 to 0.2</td><td>0.2 to 0.4</td><td>0.4 to 0.8</td></tr>
</table>
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).</td></tr>
<tr><td>3.5 Renewable Energy Provision</td><td>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</td></tr>
</table>

Section Reference	Description
	intended that electricity generated by these solar panels will be consumed on site and not be exported to the grid.
3.6.3 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 3.9, Chapter 3 – Project Description. ▪ 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.
3.6.4 Contaminated land – pipes and fittings	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.
3.2.1.3 Construction (Wherrew WSI&PS)	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.
3.2.6.2 Construction (Bonniconlon BPS)	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.
Operational	
3.9 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

Section Reference	Description

drawings, however final number and position will be subject to detailed design undertaken by the Appointed Contractor.

Dewatering and controlled scour discharges of treated water are required as part of construction, commissioning and maintenance activities 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, 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.

For the seven key locations, the scour proposal is listed in Table 21-6.

Table 21-6 — 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 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.
Lisglennon RWS&PS	Yes	Minimal volumes expected at flowmeter chamber and associated pipework. Raw water, discharge into nearby watercourse.
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

Section Reference	Description		
			remainder of the 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.
	Only raw water or dechlorinated water will be discharged. All discharge methods are subject to detailed risk assessment and agreement from relevant stakeholders. All anticipated discharge locations have been identified and assessed 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 (see Chapter 7 Biodiversity, Chapter 8 – Agronomy and Chapter 10 – Water (Hydrology and Hydrogeology)). Based on current information, no significant environmental or ecological impacts are anticipated. Agreement will be sought with relevant stakeholders (such as landowners or the local authority) in advance as appropriate. Where it is concluded that dechlorinate/treated water should not be discharged into the environment, water will be collected and tankered to an appropriate disposal location, where allowed.		
3.11.1 Road Construction Schedule	Road reinstatement will be carried out in agreement with the roads authority. Further discussions will be held with the Local Roads Authorities once a T2 Road Opening Application is submitted for the Main Works.		
3.2.7.2. Construction (Windy Gap BPT)	The Appointed Contractor will implement measures to prevent sediment runoff, uncontrolled drainage, fuel or chemical spillages, and damage to retained bog habitat. 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 this EIAR and the NIS.		
3.2.1.2. Construction (Wherrew RWI&PS)	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		

Section Reference	Description
	and ecological constraints. Construction methodology will be agreed with the relevant stakeholders before construction. 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. Discharge will only occur following adequate settlement.
3.2.1.2. Construction (Wherrew RWI&PS)	The intake pipe will be protected using a suitable surround and fascine mattressing, ballasted with clean, washed stone. Re-use of materials will be managed via the CRWMP
3.2.1.2. Construction (Wherrew RWI&PS)	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. Re-use of materials will be managed via the CRWMP.

21.2 Chapter 6 – Population and human Health

Mitigation and monitoring measures identified in Chapter 6 – Population and Human Health are presented in Table 21-7.

Table 21-7 — Mitigation and monitoring measures – Population and Human Health

Section Reference	Description
	Construction
Section 6.6	The CEMP will include mitigation measures to minimise impacts on land use, nuisances associated with the attraction of vermin or other pests and agricultural holdings during construction.
• Section 6.6	As noted in the Construction Works Preliminary Traffic management Plan (CWPTMP) (Appendix 15-1, Volume 3 of the EIAR), a Construction Works Traffic Management Plan (CWTMP) will be developed from this document prior to construction. It will include the following: • The location and details of all proposed temporary traffic management measures including any lane closures and construction vehicle accesses; • Separate detailed plans showing all significant construction stages and phases; • The location and details of all temporary signage in full compliance with Chapter 8 of the Traffic Signs Manual1 (Department of Transport, Tourism and Sport, 2019) including mobile Variable Message Sign's and road markings;

[1] Department of Transport, Tourism and Sport (2019). Traffic Signs Manual.

Section Reference	Description
	• Bespoke designs for each phase or stage must be included, standard traffic management layouts from Chapter 8 of the Traffic Signs Manual (Department of Transport, Tourism and Sport, 2019) are not acceptable; • The location and details of all temporary safety barriers; • Details of any temporary traffic diversions including location and details of all diversion signage; • Details of any temporary pavement surfaces required to facilitate the works should be described; • Details of anticipated works deliveries and storage of materials; and, • Risk Assessments for design and construction of temporary traffic management where relevant.
Table 6-21	The Proposed Development should minimise possible disruption to users of active travel routes during the construction phase for the installation of the new treated water pipeline. The CWPTMP sets out measures such as temporary footpath / cycle surfaces and signage. Where works are to occupy footpaths then dedicated protected routes must be provided that do not require crossing of the carriageway.
Table 6-21	The Proposed Development should minimise where possible disruption to local residents. The CWPTMP sets out recommended traffic management e.g. diversions, full road closures, land closure and stop / go systems, at seven sections of road intersected by the Red Line Boundary. The plan takes account of any businesses or residents requiring roads for access. Where works are to occupy footpaths then dedicated protected routes must be provided that do not require crossing of the carriageway. It is noted that safety on the road network will be maintained and all work carried out in accordance with appropriate safety guidance and legislative requirements.
Table 6-21	As set out in in the CWPTMP, diversionary routes, full road closures, land closure and stop / go systems will be implemented along all directly affected sections of road. It is noted that safety on the strategic road network will be maintained and all work carried out in accordance with appropriate safety guidance and legislative requirements. Speed limits will also be in place at affected roads. Signage and a liaison officer will help to increase awareness of any temporary road alterations during construction.
Table 6-21	The Proposed Development should minimise where possible disruption to local businesses, particularly those reliant on the transport network such as farms. As set out in in the CWPTMP, diversionary routes, full road closures, land closure and stop / go systems will be implemented along all directly affected sections of road. The plan takes account of any businesses requiring roads for access. Where works are to occupy footpaths then dedicated protected routes must be provided that do not require crossing of the carriageway. It is noted that safety on the strategic road network will be maintained and all work carried out in accordance with appropriate safety guidance and legislative requirements.
Table 6-21	The Proposed Development should minimise where possible disruption to schools if works are undertaken during term time. As set out in in the CWPTMP, diversionary routes, full road closures, land closure and stop / go systems will be implemented along all directly affected sections of road. Where schools will be directly impacted, works will not be permitted during drop-off and pick-up times, and will be confined to

Section Reference	Description
	outside of school hours. Where works are to occupy footpaths then dedicated protected routes must be provided that do not require crossing of the carriageway. It is noted that safety on the strategic road network will be maintained and all work carried out in accordance with appropriate safety guidance and legislative requirements. All such issues will be fully explored as part of the detailed design and set out within the CEMP.
Table 6-21	The Proposed Development should minimise where possible disruption to public transport services. As set out in in the CWPTMP, diversionary routes, full road closures, land closure and stop / go systems will be implemented along all these affected sections of road. It is noted that safety on the strategic road network will be maintained and all work carried out in accordance with appropriate safety guidance and legislative requirements.
Table 6-21	The CWPTMP specifically considers Belleek Castle Hotel in the traffic management measures. Where works are to occupy footpaths then dedicated protected routes must be provided that do not require crossing of the carriageway. Communication with business owners prior to and throughout construction works affecting property and setting should be undertaken. It is noted that all work carried out in accordance with appropriate safety guidance and legislative requirements.
6.9 Monitoring Requirements	Measures to avoid negative impacts on population and human health are largely integrated into the design and layout of the Proposed Development. Compliance with the design and layout will be a condition of any permitted development. Monitoring of compliance with Health & Safety requirements will be undertaken by the Project Supervisor for the Construction Process. The monitoring of the effects of this development on Population and Human Health will primarily take place in line with the recommendations set out within the specific chapters of the EIAR including Chapter 11 – Air quality, Chapter 13 – Noise and Vibration, Chapter 15 – Traffic and Chapter 19 – Risk of Major Accidents and Disasters.
6.9 Monitoring Requirements	Owing to potential pressures on local housing, facilities and amenities arising as a result of an of non-local construction workers associated with multiple projects (identified in Table 6-23 – estimated work force numbers for cumulative projects) it is recommended that, in liaison with local authority officers, appropriate monitoring and engagement with affected stakeholders is undertaken to ensure construction works associated with the Proposed Development do not exacerbate pressures on these receptors.

21.3 Chapter 7 – Biodiversity

Mitigation and monitoring measures identified in Chapter 7 – Biodiversity are presented in Table 21-8.

Table 21-8 — Mitigation and monitoring measures – Biodiversity

Section Reference	Description
7.4.3 Brusna River Crossing	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 will be used for the Brusna River crossing.

Section Reference	Description
7.5.1 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. Horizontal Directional Drilling (HDD) and pipe jacking) at major watercourses, including the Brusna River and all ecologically sensitive streams, to avoid instream works and minimise/prevent disturbance to aquatic habitats and species. ▪ Reusing the existing sub estuarine trunk main for the River Moy Crossing, avoiding intertidal disturbance and associated bird disturbance. ▪ Routing approximately 24.65 km of the approx. 30.2 km pipeline within existing road corridors to avoid terrestrial habitat loss and fragmentation. ▪ On off road sections, utilising existing field entrances to minimise hedgerow removal. ▪ In Belleek Woods, confining the pipeline to established tracks/roadways to avoid woodland habitat loss, tree felling and invasive species. ▪ 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.
7.5.1.1 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 approximately 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.

Section Reference	Description
	▪ 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: o 45 dB LAr,T during daytime hours (07:00-19:00); o 40 dB LAr,T during evening hours (19:00-23:00); and o 35 dB LAeq,T during night-time hours (23:00-07:00).
7.5.2 Preconstruction Mitigation Measures	
7.5.2.1 Confirmatory surveys	In advance of works, the Contractor's Ecological Clerk of Works (ECoW) or the Contractor's appointed ecologist will complete preconstruction surveys of the following ecological features to ascertain if they are found around the Proposed Development site since the previous surveys carried out with the aim to avoid interaction with and impact to species: ▪ Otter breeding/resting sites at the Brusna River crossing, and all other stream crossings for 50m upstream and downstream of the crossing points. Otter surveys will be carried out having regard to guidance of NRA (2009); ▪ Invasive species surveys in Belleek Woods will be carried out having regard to guidance of Transport Infrastructure Ireland; ▪ Breeding bird surveys as detailed in Section 7.5.3.7 below, any bird surveys will be carried out having regard to guidance of NRA; ▪ Common spotted orchid survey along the western gravel laneway in Belleek Woods (Refer to Section 7.5.3.5.3 below).
7.5.2 Preconstruction Mitigation Measures 7.5.2.2 Reporting	The results of preconstruction surveys will inform the refinement of mitigation measures (if required) in the updated CEMP which the Appointed 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 Éireann and as additionally required by any planning conditions.
7.5.3 Construction Stage Mitigation Measures	
7.5.3.1 Construction stage monitoring	All works carried out within or near ecologically sensitive areas, i.e. within an SAC/SPA, at loughs, at watercourse crossings, within Belleek Woods and hedgerow/treeline intersections 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 7-15 in the EIAR.
7.5.3.2 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), within woodlands and greenfield sites, 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,

Section Reference	Description
	▪ Have demonstrable experience with overseeing construction in designated conservation sites. In the detailed CEMP, which the Contractor will be required to prepare and 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 50 m 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.
7.5.3.3 Surface Water and Aquatic Species Mitigation Measures – to be implemented during the construction phase.	
7.5.3.3.1 Off Road Surface Water Feature Crossings	The following surface water quality mitigation measures will be implemented at all open channel watercourses crossed by the pipeline, this includes the Brusna River, thirteen EPA identified streams and one field drain near Lough Talt. In addition, these mitigation measures will be implemented in the vicinity of the Moy Estuary, where the proposed pipeline connects to existing infrastructure and does not cross the estuary. The locations of these Off Road areas are provided in Table 7-15 of Chapter 7 – Biodiversity, and included in the CEMP (Appendix 3-3, Volume 3 of the EIAR). 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

Section Reference	Description
	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; and, ▪ 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.
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 7-15 for locations (Chapter 7 – Biodiversity, and included in the CEMP, Appendix 3-3, Volume 3 of the EIAR). ▪ 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; and, ▪ A record of its installation, inspection and removal will be maintained by the ECoW.
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;

Section Reference	Description
	▪ 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; and, ▪ 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.
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 Environmental 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 (110% of the capacity of the tank) within the construction compound.
7.5.3.3.2	Works at Wherrew Raw Water Intake and Pumping Station at Lough Conn

Section Reference	Description
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/aggregates, 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 birds are overwintering within Lough Conn and Lough Cullin SPA, namely October to March inclusive. ▪ Works directly within Lough Conn waterbody are only to be undertaken during the months of April–September inclusive. ▪ The pipeline will be laid 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.
Cofferdam – Sheet Piling (if required)	▪ Sheet piling may be required as part of temporary cofferdam installation to enable dry working conditions for intake upgrade works. ▪ Works limited to a short duration (typically 1–2 days) to minimise disturbance. ▪ Use of resonance-free vibratory piling techniques to reduce underwater noise and vibration. ▪ Installation of acoustic shrouds and temporary acoustic barriers where required. ▪ Implementation of restricted working hours to limit disturbance. ▪ Timing of works between July and September to avoid sensitive periods for fish (spawning, incubation, juvenile development). ▪ Works scheduled outside the overwintering period for SPA waterbirds to avoid disturbance.
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.

Section Reference	Description
	▪ 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.
7.5.3.3.3 Works at River Moy Crossing	The following mitigation measures will be employed at the west bank and east bank tie in locations to the existing culvert under the River 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.
7.5.3.3.4 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.

Section Reference	Description
	▪ 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.
7.5.3.3.5 Pipeline Works adjacent to Lough Talt	The Contractor will employ the following mitigation measures along the approx. 2 km 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.
7.5.3.4 Wetland Site Mitigation Measures	The Contractor will employ the following mitigation measures along the wetland sites adjacent to the pipeline route, locations are detailed in Table 7-15 (Chapter 7 – Biodiversity, and included in the CEMP (Appendix 3-3, Volume 3 of the EIAR). ▪ 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 continuous silt curtains, silt fencing, straw bales or similar interceptors on road edges adjacent to wetland sites where no natural barrier exists. ▪ Position all silt/sediment barriers at the lowest feasible point to capture sediment laden runoff before it reaches wetland soils or channels. ▪ Avoid any excavation, stockpiling or vehicle turning on land draining directly toward wetland areas. ▪ Restrict working areas to the minimum footprint required, with machinery movement confined to existing hard surfaces. ▪ Store excavated material on the opposite side of the road from wetland habitats and ensure it is adequately covered. ▪ Reinstate roadsides immediately after works, replacing verge vegetation and stabilising soils as soon as possible. ▪ Avoid works during periods of saturated ground conditions or heavy rainfall when runoff risk is highest. ▪ Ensure that any trench dewatering effluent is discharged through settlement tanks or vegetated areas, never directly toward wetlands.

Section Reference	Description
	▪ Maintain strict pollution prevention controls (fuel storage, refuelling protocols, spill kits) at all roadside wetland sections.
7.5.3.5 Habitat mitigation measures	
7.5.3.5.1 Mitigation for Hedgerow and Treeline Loss	The Contractor will implement the following measures where there is hedgerow or tree loss along off road sections of the pipeline. ▪ Replant all lost hedgerow and treeline sections on a like for like basis in accordance with Uisce Éireann replanting policy. ▪ Use native species sourced locally such as hawthorn, blackthorn, hazel, and holly species where necessary. ▪ Reinstate linear connectivity by planting reinstated hedgerow sections to match the original alignment and width. ▪ Protect newly planted hedgerows with temporary stockproof fencing until established. ▪ Undertake planting at the earliest suitable season following works.
7.5.3.5.2 Mitigation Measures for Belleek Woods	The following trees protection measures will be implemented for the pipeline installation within Belleek Woods. The mitigation and protection measures are also included in the Arboricultural Report included in Appendix 7-1, Volume 3 of the EIAR). ▪ Works will be monitored by a suitably qualified arboriculturist who will delineate exclusion zones and root protection zones. ▪ Install 2.3 m high protective barriers around all retained trees following BS5837:2012, marked as construction exclusion zones. ▪ Keep all construction traffic, storage, spoil and machinery outside exclusion zones. ▪ Avoid excavation within identified root protection zones unless supervised and carried out using vacuum excavator / air spade or hand tools only. ▪ Retain all significant roots and avoid severing roots larger than 25 mm diameter. ▪ Root barrier membrane will then be put in place between the roots and the pipeline, where required, to ensure that the preserved roots are deflected away from infrastructure. ▪ Carry out any necessary access facilitation pruning only by qualified arborists, ▪ Use only low ground pressure machinery under 2 tonnes within protection zones. ▪ Fell or trim dangerous, unstable or diseased trees (including those affected by ash dieback) within falling distance of the works area. ▪ Maintain appropriate separation distances from all retained trees during excavation and construction activities. ▪ Avoid root severance and soil disturbance wherever possible. ▪ Ensure all tree works are carried out by qualified personnel with appropriate certification. ▪ Apply pruning or cleaning to specific trees along the route where required, such as crown cleaning or reducing end weight. ▪ Monitor trees and maintain safe offsets during construction. ▪ Protect healthy trees requiring no action through exclusion fencing and avoidance of root protection areas.
7.5.3.5.3 Mitigation Measures for Orchids	The following mitigation measures will be implemented for the pipeline installation along the western gravel laneway of Belleek Woods:

Section Reference	Description
along Belleek Woods Laneway	▪ The gravel laneway on the west side of Belleek Woods will be subject to a pre-construction botanical survey in spring/early summer by the Contractor's ECoW. ▪ Should orchids be found during pre-construction surveys, the Contractor will avoid pipeline installation works in the area of orchids during the peak growing and flowering season; May-August. ▪ In any area where orchids are identified, any ground vegetation clearance should be undertaken outside of the orchid growing season, i.e. during late autumn – winter.
7.5.3.5.4 Plant Sites Landscaping and Biodiversity Enhancement Measures	The following landscaping and biodiversity enhancement measures are included in the Proposed Development design Drawings Ref: 10025936-ATK-W1-ZZ-DR-CE-211723 - 10025936-ATK-T2-ZZ-DR-CE-211723). **Landscaping Measures:** Woodland mix planting across multiple sites, including: ▪ 1,525 m^2 at Wherrew RWI&PS; ▪ 4,888 m^2 at Lisglennon WTP; ▪ 1,013 m^2 at Bonniconlon BPS. Creation of extensive wildflower areas by implementation of reduced mowing regimes, including: ▪ 2,723 m^2 at Wherrew RWI&PS; ▪ 13,180 m^2 at Lisglennon WTP; ▪ 2,027 m^2 at Lisglennon RWS&PS; ▪ 856 m^2 at Lough Talt WTP. Hedgerow planting and reinstatement, including: ▪ 87 m at Lisglennon RWS&PS; ▪ 118 m at Bonniconlon BPS; ▪ 87 m at Bonniconlon Reservoir; ▪ 126 m at Lough Talt WTP; ▪ 65 m hedgerow and 10 m treeline reinstated along the pipeline corridor. **Biodiversity Enhancement Measures:** ▪ Installation of bat boxes at suitable Plant Sites (Wherrew RWI&PS, Lisglennon WTP, Bonniconlon BPS, Lough Talt WTP). ▪ Installation of bird boxes at the same locations to enhance nesting opportunities for local bird species. ▪ Installation of insect boxes to support bees, wasps, beetles and other invertebrates. ▪ Construction of hibernacula (e.g., stone/log refuges) at designated sites to support amphibians, reptiles and invertebrates.
7.5.3.5.5 Windy Gap Break Pressure Tank Site – Bogland Mitigation Measures	Peat will be salvaged and reinstated at Windy Gap BPT site to restore upland bog surface conditions. All peat excavated during the works will be carefully salvaged for reinstatement. All salvaged peat materials will be kept wet by the Contractor for the duration of construction activities. The underground infrastructure and the tank will be buried / surrounded by reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. Excess peat will be used to form low bunds around the site, ensuring that all peat resources are retained on site. The following mitigation measures will be employed at the Windy Gap BPT Site:

Section Reference	Description
	▪ The Contractor will strip and store peat separately from mineral soils, keeping intact turves oriented correctly for reinstatement. ▪ The stripping and salvaging of peat materials will be undertaken under the supervision of the ECoW. ▪ Salvaged peat shall be temporarily stored in the northeast section of the Windy Gap BPT Site where there is no planned infrastructure. ▪ The Contractor will ensure that the salvaged peat material remains wetted for the duration of construction activities so as to prevent desiccation of peat materials. ▪ The ECoW will undertake inspections (minimum of two per month) of the salvaged / stored peat materials to ensure that materials are wetted, are not subject to desiccation and remain in good condition for reinstatement. ▪ Where possible, the Contractor will re-lay salvaged peat over underground infrastructure and around the tank immediately after construction. ▪ Should the new underground infrastructure or the tank be required to be left exposed for any prolonged period of time, for example for tank testing purposes (typically 1 month), the Contractor shall ensure that stored / salvaged peat material remains wetted throughout this period so as to prevent desiccation of peat materials. ▪ Following the covering of underground infrastructure and tank sides with salvaged peat material, any surplus peat materials will be used to form low bunds that blend with the natural bog surface. The alignment of the bunds will be in line with the Windy Gap BPT Proposed Site Landscaping Plan (Drawing Ref; 10025936-ATK-T1-ZZ-DR-CE-211723). ▪ The Contractor will avoid deep excavation wherever possible to maintain natural hydrological conditions. ▪ The Contractor will minimise vehicle tracking on peat and will use light weight plant and bog mats within the site to prevent compaction outside of infrastructure areas. ▪ The Contractor will encourage natural revegetation by reinstating sphagnum rich peat layers and minimising surface compaction.
7.5.3.6 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.

Section Reference	Description
7.5.3.7 Birds – mitigation and monitoring measures	Removal of nesting habitat (hedgerows and treeline habitats utilised by bird species) will be carried outside the breeding bird season, which runs from 1 March to 31 August, inclusive. Where nesting habitat clearance cannot be avoided during this period the ECoW will oversee clearance of nesting habitat and ensure the area is free of nesting birds. Should nests be found clearance will not be undertaken until chicks have fledged or the nest is no longer in use.
7.5.4 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.
7.5.5 Locations for Construction Phase Mitigation Measures	Table 21-9 outlines the locations where the aforementioned mitigation measures will be employed. These are included in the CEMP (Appendix 3-3, Volume 3 of the EIAR).

Table 21-9 – Locations for Mitigation Measures – Biodiversity

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 7.5.3.3.2 & 7.5.3.5.3 & 7.5.3.6	Y
Moyne Stream Crossing	On	880	Open Cut	Refer to Section 7.5.3.3.4	Y
Newtownwhite Stream Crossing	On	2600	Trenchless	Refer to Section 7.5.3.3.4	Y
Broadlands of Knockafarson Stream Crossing	On	2900	Open Cut	Refer to Section 7.5.3.3.4	Y
No Name Stream Crossing	On	3520	Trenchless	Refer to Section 7.5.3.3.4	Y
Abbeytown Stream Crossing	Off	3720	Trenchless	Refer to Section 7.5.3.3.1	Y
No Name Stream Crossing	Off	3880	Trenchless	Refer to Section 7.5.3.3.1	Y
Roadway trenching next to Wetland Site	On	4700-5540	N/A	Refer to Section 7.5.3.4	Y
Field Drain Crossing	Off	5630	Open Cut	Refer to Section 7.5.3.3.1	Y

Location	On Road / Off Road	Chainage	Watercourse Crossing Methodology	Mitigation Measures	ECoW Supervision & Monitoring
Illanamuck Stream Crossing	On	8020	Open Cut	Refer to Section 7.5.3.3.4	Y
Belleek Woods	N/A	9920 - 10320	N/A	Refer to Section 7.5.3.5.2	Y & Arboricultural Support
River Moy Crossing	On	10200	Existing duct	Refer to Section 7.5.3.3.1 & 7.5.3.3.3	Y
Field Drain of Crossing	On	11830	Trenchless	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	12610	Open Cut	Refer to Section 7.5.3.3.4	Y
Roadway trenching next to Wetland Site	On	13880-14350	N/A	Refer to Section 7.5.3.4	Y
Brusna River Crossing	Off	15280	Trenchless	Refer to Section 7.5.3.3.1	Y
No Name Stream Crossing	On	16860	OC or Trenchless	Refer to Section 7.5.3.3.4	Y
Fiddaun Stream Crossing	Off	17220	Trenchless	Refer to Section 7.5.3.3.1	Y
Bonniconlon BPS	N/A	17760	N/A	Refer to Section 7.5.3.5.3	Y
Srafaungal Stream Crossing	Off	17850	Trenchless	Refer to Section 7.5.3.3.1	Y
Bunnyconnellan West Stream Crossing	Off	20470	Trenchless	Refer to Section 7.5.3.3.1	Y
Bonniconlon Reservoir	N/A	20700	N/A	Refer to Section 7.5.3.5.3	Y
Field Drain Crossing	On	21050	Open Cut	Refer to Section 7.5.3.3.4	Y
Srafaungal Stream Crossing	Off	21700	Trenchless	Refer to Section 7.5.3.3.1	Y
Roadway trenching next to Wetland Site	On	22420-27900	N/A	Refer to Section 7.5.3.4	Y
Windy Gap BPT	N/A	23700	N/A	Refer to Section 7.5.3.5.4	Y
No Name Stream Crossing	On	25730	Open Cut	Refer to Section 7.5.3.3.4	Y

Location	On Road / Off Road	Chainage	Watercourse Crossing Methodology	Mitigation Measures	ECoW Supervision & Monitoring
Field Drain Stream Crossing	On	25810	Open Cut	Refer to Section 7.5.3.3.4	Y
No Name Stream Crossing	On	25970	Trenchless	Refer to Section 7.5.3.3.4	Y
Glenree Stream Crossing	Off	26280	Trenchless	Refer to Section 7.5.3.3.1	Y
Field Drain Crossing	On	27175	Open Cut	Refer to Section 7.5.3.3.4	Y
Lough Talt Roadway	N/A	27900-29900	N/A	Refer to Section 7.5.3.3.5	Y
Field Drain Crossing	On	28830	Open Cut	Refer to Section 7.5.3.3.4	Y
No Name Stream Crossing	Off	28070	Trenchless	Refer to Section 7.5.3.3.1	Y
Field Drain Crossing	On	28350	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	28730	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	28950	Open Cut	Refer to Section 7.5.3.3.4	Y
Field Drain Crossing	On	29295	Open Cut	Refer to Section 7.4.3.3.4	Y
Field Drain Crossing	Off	29470	Open Cut	Refer to Section 7.4.3.3.4	Y
Lough Talt WTP	N/A	30220	N/A	Refer to Section 7.4.3.5.3	N

21.4 Chapter 8 – Agronomy

Mitigation and monitoring measures identified in Chapter 8 – Agronomy are presented in Table 21-10.

Table 21-10 — Mitigation and monitoring measures – Agronomy

Section Reference	Description
8.6.1 Embedded Mitigation	The environmental assessment team has worked in collaboration with the infrastructure design team to avoid or reduce environmental effects through the design of the Proposed Development. These measures are referred to as embedded mitigation, meaning they form part of the project design and construction methodology described in Chapter 3 – Project Description of the EIAR.

Section Reference	Description
	Embedded mitigation measures incorporated into the Proposed Development include the following: ▪ The treated water trunk main network has been routed predominantly along existing road corridors, where practicable, thereby reducing the extent of interaction with agricultural land; ▪ Only limited sections of the pipeline route traverse agricultural land (approx. 4.2 km), thereby minimising potential impacts on agricultural landholdings; ▪ Pipeline infrastructure will be installed underground, allowing agricultural lands affected during construction to be reinstated and returned to agricultural use following completion of works; ▪ The BPS and BPT infrastructure sites have been designed with relatively small footprints, thereby minimising permanent land take within agricultural lands; and, ▪ The Windy Gap BPT will be constructed as a buried reinforced concrete structure, reducing potential surface disturbance and landscape impacts. These embedded mitigation measures have been incorporated into the design of the Proposed Development.
Section 8.6.2 Additional Mitigation Measures	Additional mitigation measures are proposed to avoid or reduce potential adverse effects on agricultural land, farming activities and agricultural infrastructure during the Construction Phase of the Proposed Development. These measures supplement the embedded mitigation incorporated into the project design and will be implemented through the Construction Environmental Management Plan (CEMP). Where appropriate, monitoring will be undertaken, implemented by the Appointed Contractor, during construction to confirm that mitigation measures are implemented effectively. The Contractor shall comply with all national animal health and biosecurity requirements in force at the time of construction, including any disease control measures, movement restrictions or exclusion zones implemented by the DAFM or other competent authority. Where required, additional site-specific biosecurity measures will be implemented in consultation with affected landowners and the relevant authorities to minimise the potential for disease transmission between agricultural holdings. Where agricultural land is permanently acquired or temporary disturbance to agricultural land occurs, compensation will be addressed through the applicable statutory processes and any agreements between Uisce Éireann and affected landowners. As compensation does not constitute environmental mitigation, it has not been taken into account in the assessment of effects or residual effects presented in this chapter.
8.6.2.1 Construction Phase Mitigation	
Land Access and Farm Operations	Construction activities will be confined to the defined working areas associated with the pipeline infrastructure installation. Temporary disturbance to agricultural land will be minimised and agricultural land will be reinstated to its pre-construction condition following completion of the works. Access to agricultural land will be maintained, where practicable, throughout the construction period and temporary access arrangements will be provided where existing farm access routes are disrupted.
Liaison with Landholders	Ongoing communication will be maintained with affected landowners and land users before and during construction. Construction activities will, where practicable, be coordinated with farming operations to minimise disruption to agricultural activities.

Section Reference	Description
Protection of Farm Infrastructure and Services	Existing agricultural infrastructure, including fencing, gates, water supplies, livestock drinking troughs and other farm services, will be protected where practicable. Any infrastructure temporarily removed or disturbed during construction will be reinstated or suitable temporary alternative arrangements provided, where required.
Soil Handling and Land Reinstatement	Topsoil and subsoil will be stripped, stored and reinstated separately to preserve soil structure and agricultural productivity. Following pipeline infrastructure installation, disturbed agricultural land will be regraded, reinstated to pre-construction levels and reseeded, where appropriate, to facilitate the return of agricultural use.
Protection of Field Drainage	Existing agricultural drainage systems encountered during construction will be identified and protected where practicable. Where field drains are intercepted, they will be reinstated or replaced as necessary to maintain existing drainage function and agricultural productivity.
Biosecurity	The Contractor will implement appropriate biosecurity measures throughout the construction period. Construction machinery will arrive on site clean and free of soil and vegetation, equipment will be cleaned where required before moving between locations, and all works will comply with the biosecurity and environmental management procedures contained within the CEMP together with any animal health or disease control measures in force at the time of construction
Appendix 8-2 – and Appendix 8-3	Proposed Mitigation Measures are set out in detail in Appendix 8-2 and Appendix 8-3, Volume 3 of the EIAR. These provisions include: ▪ Landholder consultation; ▪ Access arrangement; ▪ Minimising disruption; ▪ Provision of temporary fencing; ▪ Appropriate soil stripping, storage, backfilling and reinstatement and management; and ▪ Restoration.

Operational measures are set out in Table 21-11.

Table 21-11 — Operational Phase Mitigation Measures for Agricultural Receptors

Mitigation Topic	Mitigation Measures
Section 8.6.2.2 Operational Phase Mitigation	Operational Phase mitigation measures proposed are the embedded mitigation incorporated into the design of the Proposed Development. The treated water pipeline infrastructure will remain buried below ground, allowing agricultural activities to continue across the majority of affected land subject to the permanent wayleave restrictions. Operational effects are primarily associated with permanent wayleave restrictions, permanent infrastructure sites and routine inspection and maintenance activities. Routine inspection and maintenance activities will be undertaken in accordance with Uisce Éireann operational procedures and access to agricultural land will be managed in consultation with affected landowners where required.
Land Access and Farm Operations	Construction activities will be confined to the defined working areas associated with the pipeline infrastructure installation. Temporary disturbance to agricultural land will be

Mitigation Topic	Mitigation Measures
Section 8.6.2.2 Operational Phase Mitigation	Operational Phase mitigation measures proposed are the embedded mitigation incorporated into the design of the Proposed Development. The treated water pipeline infrastructure will remain buried below ground, allowing agricultural activities to continue across the majority of affected land subject to the permanent wayleave restrictions. Operational effects are primarily associated with permanent wayleave restrictions, permanent infrastructure sites and routine inspection and maintenance activities. Routine inspection and maintenance activities will be undertaken in accordance with Uisce Éireann operational procedures and access to agricultural land will be managed in consultation with affected landowners where required.
	minimised and agricultural land will be reinstated to its pre-construction condition following completion of the works. Access to agricultural land will be maintained, where practicable, throughout the construction period and temporary access arrangements will be provided where existing farm access routes are disrupted.
Appendix 8-2 – and Appendix 8-3	Proposed Mitigation Measures are set out in detail in Appendix 8-2 and Appendix 8-3, Volume 3 of the EIAR. These provisions include: ▪ Landholder consultation; ▪ Access arrangement; ▪ Minimising disruption; ▪ Provision of temporary fencing; ▪ Appropriate soil stripping, storage, backfilling and reinstatement are management; and Restoration.

Table 21-12 — Construction Phase Mitigation Measures for Agricultural Receptors

Mitigation Topic	Mitigation Measures
Land Access and Farm Operations	Construction activities will be confined to the defined working areas associated with the pipeline infrastructure installation. Temporary disturbance to agricultural land will be minimised and agricultural land will be reinstated to its pre-construction condition following completion of the works. Access to agricultural land will be maintained, where practicable, throughout the construction period and temporary access arrangements will be provided where existing farm access routes are disrupted.
Liaison with Landholders	Ongoing communication will be maintained with affected landowners and land users before and during construction. Construction activities will, where practicable, be coordinated with farming operations to minimise disruption to agricultural activities.
Protection of Farm Infrastructure and Services	Existing agricultural infrastructure, including fencing, gates, water supplies, livestock drinking troughs and other farm services, will be protected where practicable. Any infrastructure temporarily removed or disturbed during construction will be reinstated or suitable temporary alternative arrangements provided, where required.

Mitigation Topic	Mitigation Measures
Soil Handling and Land Reinstatement	Topsoil and subsoil will be stripped, stored and reinstated separately to preserve soil structure and agricultural productivity. Following pipeline infrastructure installation, disturbed agricultural land will be regraded, reinstated to pre-construction levels and reseeded, where appropriate, to facilitate the return of agricultural use.
Protection of Field Drainage	Existing agricultural drainage systems encountered during construction will be identified and protected where practicable. Where field drains are intercepted, they will be reinstated or replaced as necessary to maintain existing drainage function and agricultural productivity.
Biosecurity	The Contractor will implement appropriate biosecurity measures throughout the construction period. Construction machinery will arrive on site clean and free of soil and vegetation, equipment will be cleaned where required before moving between locations, and all works will comply with the biosecurity and environmental management procedures contained within the CEMP together with any animal health or disease control measures in force at the time of construction

21.5 Chapter 9 – Land, Soils and Geology

Mitigation and monitoring measures identified in Chapter 9 – Land, Soil and Geology are presented in Table 21-13.

Table 21-13 — Mitigation and monitoring measures – Land, Soils and Geology

Section Reference	Description
Section 9.6.1.1.4	The excavation of material will be minimised as much as possible to reduce the impact on land, soils and geology. Where possible, and if suitable with certainty for use, excavated material will be re-used as part of earthworks and as non-engineered backfill. Topsoil and subsoil that has been stripped as part of the construction works will be reused for backfilling pipe laying trenches and as part of landscaping works, where possible. Where soils are unsuitable for use or where excess soil is generated with no certainty for use, soils (including Made Ground) will be appropriately sampled and tested prior to off-site removal. Soils will be classified in accordance with the EPA Guidance Document 'Waste Classification, List of Waste & Determining if Waste is Hazardous or Non-Hazardous' (2018). It will be the Contractors responsibility to ensure that all waste soils are classified correctly and managed, transported and reused/disposed of offsite in accordance with the requirements of the Waste Management Act 1996, as amended, the Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste and any relevant subsequent waste management legislation. The appropriate handling and storage of soils will be detailed within a soils management plan to be included in the Construction Environmental Management Plan (CEMP) provided as Appendix 3-3, Volume 3 of the EIAR. All waste products (general waste, plastic, timber, etc.) arising during the construction phase will be managed and disposed of under the provisions of the Waste Management Act 1996 and associated amendments and regulations. All waste material will be disposed of at a fully licensed disposal / recovery facility. It will be the Contractors responsibility to ensure that a project specific Detailed Resource and Waste Management Plan (developed in accordance with 2021 EPA Guidance: Best Practice Guidelines for the preparation of resource & waste management plans for

Section Reference	Description
	construction & demolition projects) is fully implemented onsite for the duration of the project. The Resource Waste Management Plan (RWMP) will be prepared by the Waste Management Coordinator. As a minimum the RWMP will include measures for handling surplus soil and stone, municipal waste, timber, concrete, and steel. The RWMP will outline responsibilities, training, recording and reporting of waste management at the site. The WMC will be responsible for issuing Article 27 Notifications to the Environmental Protection Agency. A suitably experienced and qualified Ecological Clerk of Works (ECoW) and Environmental Manager will be present onsite during the construction phase.
Section 9.6.1.2.4	The mitigation for reducing impacts to geological heritage sites is predominantly addressed through development design. While geophysical surveys have indicated the potential for karst features to be present in the areas underlying Lisglennon WTP, no karst features have been confirmed at present. In the event that subsurface karst features (caverns, caves etc.) are identified during the construction phase, the on-site Ecological Clerk of Works (ECoW) will be notified and will ensure a karst protocol is implemented, in consultation with the Engineer, Site Manager and Client. At the River Brusna crossing, impacts to the geological feature will be minimised through the use of horizontal directional drilling (HDD). The following mitigation measures will be undertaken specifically with regard to HDD: ▪ A geotechnical assessment shall be carried out prior to horizontal directional drilling and drilling shall only be carried out at locations where conditions are suitable for the control of drilling materials. ▪ All works will be supervised by a qualified environmental engineer. ▪ No works will be undertaken near the river corridor or river banks. Reception and launch pits for the directional drilling process shall be excavated a minimum of 20 m from the stream banks. ▪ No construction activity will take place in riparian areas. Stockpiling of construction materials, refuelling of machinery and overnight parking will take place in designated compound areas. Concrete truck chute cleaning will take place in a separate appropriate onsite location. ▪ The area around the concrete/bentonite batching, pumping, and recycling plants shall be bunded using a geotextile membrane and sandbags in order to contain any spillages. Non toxic drilling fluids (e.g. Cebo Hybrid-Gel32 or similar) will be used for the Brusna River crossing. ▪ Silt fencing will be erected 5 m from the reception and launch pits used for directional drilling. ▪ Horizontal directional drilling works shall not take place at periods of high rainfall and shall be scaled back or suspended if heavy rain is forecast.
Section 9.6.1.3.4	Mitigation measures for the prevention of soil / bedrock contamination during construction, as outlined below, will be implemented by the contractor who will be responsible for ensuring these measures are fully implemented. Mitigation measures outlined in Chapter 10- Water are also applicable to the protection of soils and geology during the construction phase. The employment of good construction management practices will serve to minimise the risk of pollution from construction activities at the Proposed Project in line with the Construction Industry Research and Information Association (CIRIA) publication entitled, Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, CIRIA - C532 (2001).

Section Reference	Description
	Strict supervision of contractors will be adhered to in order to 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 soils and bedrock becoming contaminated through site activities. The highest standards of site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the site and surrounding environment during construction. The Environmental Manager and the ECoW will be given the task of overseeing the pollution prevention measures agreed for the site to ensure that they are operating safely and effectively. In the event that ground contamination is encountered during the construction works, all works will cease. Advice will be sought from an experienced contaminated land specialist and a phased environmental risk assessment (specifically to assess any associated potential environmental and/ or human health risks) will be undertaken in accordance with relevant EPA guidance 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013) and UK Environment Agency Guidance 'Land contamination risk management (LCRM)' (UK EA, 2025); Mitigation will comprise the following: ▪ Temporary onsite groundwater monitoring wells will be either suitably protected for the duration of the works and / or appropriately decommissioned in accordance with best practice guidance (SEPA guidance document "Good Practice for Decommissioning Redundant Boreholes and Wells"); ▪ Earthworks / piling plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site for each phase of the Proposed Development; ▪ The need for vehicle wheel wash facilities will be assessed by the Contractor depending on the phasing of works and onsite activity and will be installed as needed, near any site entrances and road sweeping implemented as necessary to maintain the road network in the immediate vicinity of the site; ▪ Dust suppression measures (e.g., dampening down) will be implemented as necessary during dry periods; ▪ All excavated materials will be stored away from the excavations / immediate works area, in an appropriate manner at a safe and stable location. The maximum height of temporary stockpiles will be 3 m; ▪ The Appointed Contractor will aim to maximise the reuse of soil and stone on site. Surplus clean material will be transported off site as a by-product under Article 27. The WMC will be responsible for notifying the EPA via the EDEN portal. ▪ A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the site; ▪ All fill material imported to the site for the Proposed Project will be clean, uncontaminated, suitable engineering grade fill material; Specifically, regarding pollution control measures, the following mitigation will be implemented: ▪ Fuels, lubricants and hydraulic fluids for equipment used on the construction site, and solvents, oils, and paints, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;

Section Reference	Description
	▪ Waste oils and hydraulic fluids to be managed in accordance with best practice requirements and pollution measures as detailed in the Construction Environmental Management Plan (CEMP). The mitigation measures will be incorporated (as required) during Detailed Design Stage and will form part of a site-specific CEMP which will be implemented during the Construction Stage (including initial Site preparatory / enabling works).
Section 9.6.2.1.4 Operation and Maintenance	The Proposed Development will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention. The proposed design, from concept through to design has been developed to ensure that any potential risk of contamination to the receiving land soils and geology environmental, and water (groundwater) environment is negligible. Pollution prevention measures, such as engineered drainage, double bunded tanks, hardstanding and designated waste storage will be incorporated within the design where appropriate to mitigate the risk of ground contamination.
Section 9.10.1 Construction Phase Monitoring	Monitoring requirements to address each effect throughout the construction phase are included in section 9.6.1 as part of the impact assessment. A comprehensive monitoring and supervisory regime including monitoring of all excavations and stability assessments as required will be put in place by the Contractor to ensure that the proposed construction works are unlikely to constitute a risk to the stability of the site. This will include supervision by an onsite ECoW throughout the construction phase to ensure onsite staff adhere to best practice measures and install suitable pollution prevention measures. The WMC will retain record of materials taken off site for reuse/recovery/disposal.
Section 9.10.1 Construction Phase Monitoring	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. Prior to construction the contractor will provide plans for routine inspections, including frequencies, to be carried out throughout construction. This should include soil stockpile monitoring at Windy Gap BPT due to the sensitivity of the location, routine checks of chemical storage areas and emergency spill response inspections. The contractor will also provide a procedure for pollution incident reporting.
Section 9.10.2 Operational Phase Monitoring	Monitoring requirements to address each effect throughout the operation and maintenance phase are included in section 9.6.2 as part of the impact assessment. This includes routine monitoring in relation to land, soils and geology will not be required once the plant is operational, unless specific conditions arise or unless requested by the EPA. This will also include a procedure for reporting pollution incidents.

21.6 Chapter 10 – Water (Hydrology and Hydrogeology)

Mitigation and monitoring measures identified in Chapter 10 – Water (Hydrology and Hydrogeology) are presented in Table 21-14 and Table 21-16.

Table 21-14 — Mitigation and monitoring measures – Water – Surface water

Section Reference	Description
10.6.1 Construction Stage Mitigation Measures	
Section 9.6.1.1.4 Ecological Clerk of Works (ECoW)	As discussed in Chapter 7 – Biodiversity, the Appointed Contractor will appoint an ECoW prior to the commencement of construction. All works carried out within ecologically sensitive areas, at surface water features (lough and watercourses), within woodlands and greenfield sites, will be supervised by a suitably qualified ECoW. The ECoW shall: ▪ 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 detailed CEMP, which the Contractor will be required to prepare and 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(s) 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 24hrs 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.
10.6.1.2 Pollution Prevention Measures	The following surface water quality mitigation measures will be implemented at all open channel watercourses crossed by the pipeline, this includes the Brusna River, the Moy Estuary, 18 EPA identified streams and one field drain near Lough Talt. The locations of these Off Road areas is provided in Table 7-15 in Chapter 7 Biodiversity.

Section Reference	Description
	The following surface water mitigation measures will be implemented to avoid potential adverse effects 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 will 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, drilling fluids, cementitious materials, will 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 will 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. ▪ Where works are undertaken within close proximity to identified private groundwater abstractions, including the domestic well located approximately 5–10 m from the proposed RLB and well 1131NWW016 located approximately 45 m from the proposed RLB, enhanced pollution prevention measures shall be implemented, including the prohibition of fuel storage and refuelling activities in the immediate vicinity of the wells and the availability of spill response equipment at all times.
10.6.1.3 Silt Fencing	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 7-15 in Chapter 7 – Biodiversity 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 will terminate on high ground. ▪ They will be constructed using permeable filter fabric rather than a mesh material, ▪ The base of the silt fence will be embedded at least 15 cm into the ground and staked at 2 m intervals. ▪ The vegetated turves will 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 will remain in-situ for the duration of the watercourse crossing works.

Section Reference	Description
	▪ Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain. ▪ The fence will not be pulled from the ground, but cut at ground level and the stakes/posts removed. ▪ Silt fences will be inspected daily and after periods of heavy rainfall. ▪ A record of its installation, inspection and removal will be maintained by the ECoW. ▪ Enhanced sediment control measures shall be implemented in the vicinity of identified private groundwater abstractions due to their sensitivity to deterioration in water quality arising from sediment-laden runoff. Temporary silt control measures will be installed, where practicable, to intercept and contain sediment-laden runoff generated during construction works and prevent discharge towards the well and surrounding ground.
10.6.1.5 Release of Hydrocarbons and Chemicals	In order to prevent any potential surface water effects 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. The WMC will maintain records of waste oils collected and disposal certificates from the waste management company. ▪ 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. Any spill kits or absorbents used will be disposed of correctly in a labelled container prior to collection by a permitted waste collection company. The spill kit will be replaced as soon as practicable. The WMC will retain records of all hazardous waste transfers off site. 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 in bunds 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. ▪ Particular care will be taken during works in the vicinity of identified private groundwater abstractions, including the domestic well located approximately 5–10 m from the proposed RLB and well 1131NWW016 located

Section Reference	Description
	approximately 45 m from the Red Line Boundary. No fuels, oils, chemicals or other potentially polluting substances shall be stored within the immediate vicinity of these wells, and refuelling activities shall be undertaken in designated areas away from groundwater receptors.
10.6.1.6 Works at Wherrew Intake Lough Conn General Water Protection	The following mitigation measures are prescribed for the works at the Wherrew RWI&PS and within Lough Conn water body: ▪ 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.
10.6.1.6 Works at Wherrew Intake Lough Conn 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.
10.6.1.6 Works at Wherrew Intake Lough Conn Intake Pipeline Installation Measures	▪ Installation / laying of the new intake pipe within Lough Conn water body is not be permitted during the months when birds are overwintering within Lough Conn and Lough Cullin SPA, namely October to March inclusive. ▪ Works directly within Lough Conn water body 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.
10.6.1.6 Works at Wherrew Intake Lough Conn Cofferdam – Sheet Piling (if required)	▪ Sheet piling may be required as part of temporary cofferdam installation to enable dry working conditions for intake upgrade works. ▪ Works limited to a short duration (typically 1–2 days) to minimise disturbance. ▪ Use of resonance-free vibratory piling techniques to reduce underwater noise and vibration. ▪ Installation of acoustic shrouds and temporary acoustic barriers where required. ▪ Implementation of restricted working hours to limit disturbance. ▪ Timing of works between July and September to avoid sensitive periods for fish (spawning, incubation, juvenile development). ▪ Works scheduled outside the overwintering period for SPA waterbirds to avoid disturbance.

Section Reference	Description
10.6.1.6 Works at Wherrew Intake Lough Conn 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.
10.6.1.6 Works at Wherrew Intake Lough Conn 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.
10.6.1.6 Works at Wherrew Intake Lough Conn Invasive Species Prevention	▪ Implement full biosecurity measures for all plant, equipment, pontoons and materials used at the water body, including inspection, cleaning and disinfection before mobilising to site. ▪ Ensure no movement of water, sediment or equipment from Lough Conn to any other water body without full decontamination. ▪ Use only lake specific pumps, hoses and temporary works equipment to avoid transfer of zebra mussels or other aquatic invasive species.
10.6.1.6 Works at Wherrew Intake Lough Conn 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.
10.6.1.6 Works at Wherrew Intake Lough Conn 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. ▪ The Appointed Contractor will carry out water quality monitoring in Lough Conn during the in-lake works and on two occasions after completion of the work. Water sampling will be carried out using standard water sampling equipment by qualified personnel. Water samples will be placed in laboratory prepared containers, labelled and couriered under chain of custody to the chosen INAB accredited laboratory. A 3-day laboratory turnaround time will be requested. The analytical data will be compared with the limits provided in the Surface Water Regulations. Water sampling locations are to be positioned as follows, one sampling location at least 20 m remote from the working site, one sampling location about 5 m from the working site and one sample about 10 m from the working site. Water samples will be analysed in-situ for pH, temperature, dissolved oxygen (% saturation), and conductivity. Laboratory analysis will include total suspended solids, total dissolved solids, nitrogen and phosphorus, turbidity and total petroleum hydrocarbons. Water sampling and analysis will be carried out every other day during the in-lake works. Laboratory analytical data and interpretations will be reported to Uisce Éireann. If the analytical data identifies an increase in a particular parameter, mitigation measures will be reviewed by the Appointed Contractor and updated/amended to ensure better mitigation. This will be verified by further water sampling.

Section Reference	Description
10.6.1.7 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 water body 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.
10.6.1.8 Crossings at 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.
10.6.1.9 Pipeline Works Adjacent to Lough Talt	The Contractor will employ the following mitigation measures along the approx. 2 km section of works alongside Lough Talt: ▪ Do not allow plant, machinery or personnel to enter the lake water body 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.

Section Reference	Description
	▪ 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 water body.
10.6.1.10 Windy Gap Break Pressure Tank Mitigation Measures	Peat will be salvaged and reinstated at Windy Gap BPT site to restore upland bog surface conditions. All peat excavated during the works will be carefully salvaged for reinstatement. The tank will be buried / surrounded by reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. Excess peat will be used to form low bunds around the site, ensuring that all peat resources are retained on site. The following mitigation measures will be employed at the Windy Gap BPT Site: ▪ The Contractor will strip and store peat separately from mineral soils, keeping intact turves oriented correctly for reinstatement. ▪ The stripping and salvaging of peat materials will be undertaken under the supervision of the ECoW. ▪ Salvaged peat will be temporarily stored in the northeast section of the Windy Gap BPT Site where there is no planned infrastructure. ▪ The Contractor will ensure that the salvaged peat material remains wetted for the duration of construction activities so as to prevent desiccation of peat materials. ▪ The ECoW will undertake inspections (minimum of two per month) of the salvaged / stored peat materials to ensure that materials are wetted, are not subject to desiccation and remain in good condition for reinstatement. ▪ Where possible, the Contractor will re-lay salvaged peat over underground infrastructure and around the tank immediately after construction. ▪ Should the new underground infrastructure or the tank be required to be left exposed for any prolonged period of time, for example for tank testing purposes (typically 1 month), the Contractor will ensure that stored / salvaged peat material remains wetted throughout this period so as to prevent desiccation of peat materials. ▪ Following the covering of underground infrastructure and tank sides with salvaged peat material, any surplus peat materials will be used to form low bunds that blend with the natural bog surface. The alignment of the bunds will be in line with the Windy Gap BPT Proposed Site Landscaping Plan (Drawing Ref: 10025936-ATK-T1-ZZ-DR-CE-211723). ▪ The Contractor will avoid deep excavation wherever possible to maintain natural hydrological conditions. ▪ The Contractor will minimise vehicle tracking on peat and will use light weight plant and bog mats within the site to prevent compaction outside of infrastructure areas. ▪ The Contractor will encourage natural revegetation by reinstating sphagnum rich peat layers and minimising surface compaction.
10.6.1.11 Wetland Mitigation Measures	The Appointed Contractor will employ the following mitigation measures along the wetland sites adjacent to the pipeline route: ▪ 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.

Section Reference	Description
	▪ Install continuous silt curtains, silt fencing, straw bales or similar interceptors on road edges adjacent to wetland sites where no natural barrier exists. ▪ Position all silt/sediment barriers at the lowest feasible point to capture sediment laden runoff before it reaches wetland soils or channels. ▪ Avoid any excavation, stockpiling or vehicle turning on land draining directly toward wetland areas. ▪ Restrict working areas to the minimum footprint required, with machinery movement confined to existing hard surfaces. ▪ Store excavated material on the opposite side of the road from wetland habitats and ensure it is adequately covered. ▪ Reinstate roadsides immediately after works, replacing verge vegetation and stabilising soils as soon as possible. ▪ Avoid works during periods of saturated ground conditions or heavy rainfall when runoff risk is highest. ▪ Ensure that any trench dewatering effluent is discharged through settlement tanks or vegetated areas, never directly toward wetlands. ▪ Maintain strict pollution prevention controls (fuel storage, refuelling protocols, spill kits) at all roadside wetland sections.
10.6.2 Operational Phase	The Proposed Development will be operated in accordance with the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention. Furthermore, it should be noted that the proposed design, from concept through to preliminary design, has been developed to ensure that any potential risk of contamination to the receiving land soils and geology environmental, and water (groundwater) environment is negligible. Pollution prevention measures, such as engineered drainage, double bunded tanks, hardstanding and designated waste storage incorporated within the design will mitigate the risk of ground contamination. With regard to groundwater and surface water quality effects the following mitigation measures are proposed: ▪ All plant and equipment utilised onsite during maintenance works will be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented. ▪ Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from Site by the maintenance contractor. While temporarily onsite, all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel / oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil / chemical absorbent materials held onsite in close proximity to the tanks. Relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented. ▪ Hazardous chemicals will be stored in sealed containers in a store room of the plants workshop building. The exception being sulphuric acid which will be stored in the demineralised water treatment plant in a double walled or bunded Intermediate Bulk Container (IBC). ▪ In the unlikely event of a fuel / oil or chemical spill / leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as

Section Reference	Description
	much of the lost product as possible (relevant maintenance contractors will be responsible for ensuring that these measures are fully implemented); ▪ A maintenance programme for the proposed surface water drainage system should be implemented.
10.6.2.1 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 21-15 — Proposed Scour Management for Infrastructure Sites.

Table 21-15 — 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.

Section Reference	Description		
	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 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 (see Chapter 7 Biodiversity, Chapter 8 – Agronomy and Chapter 10 – Water (Hydrology and Hydrogeology). 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.		
10.6.2.2 Flood Risk Management	For ongoing flood risk management, all works will continue to apply the relevant Uisce Éireann Codes of Practice, Mayo and Sligo County Development Plan policies, and the Planning System and Flood Risk Management Guidelines throughout detailed design, construction, and operation. Sustainable Drainage Systems (SuDS) and routine maintenance of on-site and local drainage infrastructure will ensure ongoing resilience to extreme rainfall events.		

Section Reference	Description
Table 10-24 ▪ Brusna (North Mayo)_020 ▪ Dooyeaghny_or_ Cloonloughan_010 ▪ Moy_120 ▪ Rathroeen Stream_010	Best practice pipeline installation methods, and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff will be employed by the Contractor. Crossings at culverted surface water features are addressed below. 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 features or open excavations. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW. Additional mitigation measures are included for works at the Moy Estuary crossing in Dooyeaghny_or_Cloonloughan_010 and Rathroeen Stream_010.
Table 10-24 ▪ Behy (North Mayo)_010	Best practice pipeline installation, and construction methods at Bonniconlon and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff will be employed by the Contractor. Crossings at culverted surface water features are addressed below. 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 features or open excavations. Peat will be salvaged and reinstated at Windy Gap BPT site to restore upland bog surface conditions. All peat excavated during the works will be carefully salvaged for reinstatement. Deep excavation will be avoided wherever possible to maintain natural hydrological conditions. Vehicle tracking on peat will be minimised, using light weight plant and bog mats within the site to prevent compaction outside of infrastructure areas. The tank will be buried / surround by reinstated peat soils, thereby maintaining the surface profile and ecological character of the site as far as practicable. Excess peat will be used to form low bunds around the site, ensuring that all peat resources are retained on site. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW.
Table 10-24 ▪ Eignagh_010 ▪ Glenree_010	Best practice pipeline installation methods and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff will be employed by the Contractor. Crossings at culverted surface water features are addressed below. 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 features or open excavations. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW. Additional mitigation measures are included for pipeline works adjacent to Lough Talt.
Table 10-24 ▪ Glenree_030	In addition to pipeline installation mitigations, and those addressing culverted surface water features, silt fences are required at the River Brusna crossing between the HDD launch and reception pits and open channel water features to prevent potentially contaminated surface water run-off from works areas reaching the surface water features or open excavations. Non-toxic drilling fluids

Section Reference	Description
	to be used for HDD. More details on silt fencing mitigations are in Section 10.6.1.3.
Table 10-24 ▪ Moy_100 ▪ Lough Conn	Mitigation measures are detailed above in Section 10.6.1.6 for works at Wherrew Intake, specifically in relation to protection of the water from sedimentation and turbidity, runoff of pollutants from onshore works or spillages, avoidance of machinery entering the water and disturbance of the bed. Measures for the use of cofferdam/sheet piling, dewatering and installation of the intake pipeline are also included.
Table 10-24 ▪ Moyne_010	Best practice pipeline installation methods and pollution prevention measures to address accidental spills, mobilisation of sediment and runoff. No works are due to be carried out within ecologically sensitive areas.
Operation and Maintenance Phase	
Table 10-24 ▪ Brusna_020 ▪ Eignagh_010 ▪ Glenree_010 ▪ Moy_100 ▪ Moy_120 ▪ Moyne_010 ▪ Lough Conn ▪ Cloonaghmore_050 ▪ Rathroeen Stream_010 ▪ Behy (North Mayo)_010	Scour management is discussed in detail in Section 10.6.2.1
Table 10-24 ▪ Lough Conn	Maintenance of the intake will avoid working during periods of high winds or heavy rainfall when sediment dispersal risk is elevated, limited to a short duration and localised to the immediate area surrounding the intake. Invasive species prevention protocols will be implemented.

Table 21-16 — Mitigation and monitoring measures – Water – Groundwater

Section Reference	Description
Construction	
Table 10-24 (Groundwater – Bedrock) ▪ Ballina GWB - ▪ Bellacorick-Killala GWB ▪ Foxford GWB Groundwater (superficial)	Best practice construction methods and pollution prevention measures to address accidental spills and manage site drainage appropriately. Full pollution prevention measures are listed in section 16.6. and within the Construction Environment Management Plan. Where groundwater is encountered, the Contractor will produce a site-specific dewatering plan. Excavation, management and reinstatement of peat will be carried out in line with best practice. Appropriate management of overburden stockpiles ensuring runoff is managed. Engineering solution to address karst, should it be encountered during excavation or further assessments at detailed design stage. The measures are detailed in Chapter 9: Land, Soils and Geology.

Section Reference	Description
Table 10-24 Groundwater Abstractions	In addition to mitigation measures identified to protect groundwater, where dewatering is required in the vicinity of identified private groundwater abstractions, the wells will be monitored, where access is available, for evidence of groundwater level drawdown, reduced yield, increased turbidity or other deterioration in water quality attributable to the works. Should construction activities result in a temporary disruption to a private water supply, an alternative temporary water supply shall be provided to the affected user until the supply has recovered or appropriate remedial measures have been implemented.
Table 10-24 GWDTEs ▪ Wetland sites ▪ *Vertigo geyeri* habitat	In addition to good practice measures to control accidental spills and sedimentation, prior to commencement of work, GWDTEs and drainage pathways will be identified. Where possible, a minimum distance of 20 m between works will be maintained. Works carried out within ecologically sensitive areas will be supervised by a suitably qualified ECoW. Excavation, management and reinstatement of peat will be carried out in line with best practice. The Windy Gap BPT structure will be designed to avoid requiring any additional external protection measures, such as external tanking, to enhance durability by avoiding creation of flow paths for groundwater drainage around the structure perimeter. The tank will be structurally designed to resist backfill forces from re-use of existing clay material, rather than conventional granular engineering backfill, since granular material could provide a flow path for groundwater around the structure, leading to uneven drainage.
Operation and Maintenance phase	
Table 10-24 Groundwater (Bedrock) ▪ Ballina GWB ▪ Bellacorick-Killala GWB ▪ Foxford GWB Groundwater (Superficial) Groundwater Abstractions GWDTEs	None beyond best practice measures to address accidental spillages, runoff and fire suppression wash water.
10.9 Monitoring Requirements	In the preparation of this chapter the following monitoring requirements were identified: ▪ 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 water quality monitoring, including levels. These surveys will be set out in the CEMP. ▪ Wherrew intake: monitoring to determine the condition of the intake screen for maintenance purposes as well as routine monitoring of abstraction rates. ▪ Lisglennon RWS&PS: The rising main and associated chambers will be regularly inspected as per existing operational procedures. ▪ Windy Gap BPT: Monitoring for leaks from the tank.

Section Reference	Description
	▪ 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.

21.7 Chapter 11 – Air Quality

Construction mitigation and monitoring measures identified in Chapter 11 – Air Quality are presented in Table 21-17.

There is no mitigation required for the operational phase of the Proposed Development. No operational phase monitoring is required.

Table 21-17 — Mitigation and monitoring measures – Air Quality

Section Reference	Description
11.7.1 Construction Phase Mitigation	The Proposed Development has been assessed as having a medium risk of dust soiling effects, a low risk of dust related human health effects, and a high risk of ecological effects during the construction phase as a result of earthworks, construction and trackout activities. Therefore, the dust mitigation measures will be implemented during the construction phase of the Proposed Development. These measures are appropriate for sites with a high risk of dust impacts, as recommended by the IAQM construction dust guidance, and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.
Table 11-12 Construction Phase Dust Mitigation Measures Communications	▪ Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. ▪ The name and contact details of person(s) accountable for air quality and dust issues will be displayed in a public location at the active construction site. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information.
Table 11-12 Construction Phase Dust Mitigation Measures Site Management	▪ Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. ▪ Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Section Reference	Description
Table 11-12 Construction Phase Dust Mitigation Measures Preparing and Maintaining the Site	▪ Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. ▪ Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. ▪ A water bowser for dampening site roads and dampening of stockpile during periods of extended dry weather will be used. ▪ Dust monitoring will be implemented during the works, such as Bergerhoff gauges for dust fall with a 350 mg/m^2/d limit. Dust fall measurement will follow the VDI 2119 Bergerhoff Standard Methodology for Dust Measurement as applicable. ▪ Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period. ▪ Avoid site runoff of water or mud. ▪ Keep site fencing, barriers and scaffolding clean using wet methods. ▪ Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. ▪ Cover, seed or fence stockpiles to prevent wind whipping.
Table 11-12 Construction Phase Dust Mitigation Measures Operating vehicle/machinery and sustainable travel	▪ Ensure all vehicles switch off engines when stationary – no idling vehicles. ▪ Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. ▪ Impose and signpost a maximum-speed-limit of 25 kph on surfaced and 15 kph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). ▪ Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Table 11-12 Construction Phase Dust Mitigation Measures Operations	▪ Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. ▪ Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. ▪ Use enclosed chutes and conveyors and covered skips. ▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Table 11-12 Construction Phase Dust Mitigation Measures Waste management	▪ Bonfires and burning of waste materials are legally prohibited.
Table 11-12 Construction Phase Dust	▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable ▪ Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable.

Section Reference	Description
Mitigation Measures Measures Specific to Earthworks	Only remove the cover in small areas during work and not all at once.
Measures Specific to Construction	▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable ▪ Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as is practicable. Only remove the cover in small areas during work and not all at once.
Table 11-12 Construction Phase Dust Mitigation Measures Measures Specific to Construction	▪ Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Table 11-12 Construction Phase Dust Mitigation Measures Measures Specific to Trackout	▪ Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. ▪ Avoid dry sweeping of large areas. ▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. ▪ Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. ▪ Record all inspections of haul routes and any subsequent action in a site log book. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
Section 11.10.1 Construction Phase Monitoring	The following monitoring measures are required during the construction phase, as per the IAQM guidance (IAQM, 2024): ▪ Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This will include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary. ▪ Carry out regular site inspections to monitor compliance with the CEMP, record inspection results, and make an inspection log available to the local authority when asked. ▪ The potential for dust generation increases when rainfall is less than 0.2 mm/day (millimetres per day) and at wind speeds of greater than 10 m/s (metres per second). To determine if these conditions are likely to affect the site, the weather forecast will be consulted daily, specifically the hourly forecasts for wind speeds as well as the 12-hour rainfall radar showing anticipated amounts of precipitation in mm.

Section Reference	Description
	▪ Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. ▪ The Appointed Contractor will carry out Dust Deposition Monitoring at the nearest sensitive location during the works at the various static sites. The dust sampling methodology will be carried out as per VDI 2119 Blatt (1996). 1996-09 Determination of the Dust precipitation with collecting pots made of glass (Bergerhoff Method) or plastic. The Bergerhoff jars will be exposed for 30 days. The Bergerhoff jars will be returned to an analytical laboratory for analysis. Results will be expressed as $mg/m^2/d$. The standard limit of 350 $mg/m^2/d$ will apply. The Environmental Manager will record wind direction and weather conditions on site during dust deposition monitoring. Where the 350 $mg/m^2/d$ limit is exceeded, the Appointed Contractor will review the dust control measures and update. Further monitoring will be carried out to verify the success of the upgraded dust control measures.

21.8 Chapter 12 – Climate

Mitigation and monitoring measures identified in Chapter 12 – Climate are presented in Table 21-18

Table 21-18 — Mitigation and monitoring measures – Climate

Section Reference	Description
Section 12.7.1 Construction stage mitigation	The most significant GHG emissions from the construction stage are from materials used in the watermains and reservoirs. To reduce GHG emissions from the construction of the reservoirs, the final design will follow the public body requirements under the Green Public Procurement Strategy, including recommendations in reducing embodied carbon in cement and concrete through public procurement in Ireland (Department of Enterprise, Trade and Employment 2024), and Action Plan 2024-2027 (DECC 2024). Adherence to the DOE 2026, Whole of Government Circular Economy Strategy 2026 -2028 Acceleration document. Carbon reduction is an iterative process that will continue throughout the detailed design and construction stages. Uisce Éireann aims to further reduce embodied carbon during these future stages, achieving alignment with PAS 2080 (BSI 2023), which is a global standard for managing infrastructure carbon, through lean design and modern construction methods.
Section 12.7.1 Construction stage mitigation	During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate: ▪ Backloading of HGVs where possible to reduce transport emissions ▪ Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;

Section Reference	Description
	▪ Ensuring that fossil fuel powered plant and equipment meet the Euro Stage V emission standard; ▪ Ensuring, where practicable, that site vehicles and delivery vehicles meet the Euro VI/Euro 6 standards for emissions; ▪ Ensure all plant, machinery and vehicles are well maintained and inspected regularly; ▪ Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. A construction waste management plan will be implemented to minimise construction waste sent to landfills. Reuse and recycling of materials will be promoted to and reduce the environmental footprint of the site;
Section 12.7.1 Construction stage mitigation	The Design Team will align with Uisce Éireann standards and sustainability ambitions which are set out in its Sustainability Framework, surpassing standard regulation through; ▪ Procurement of low carbon materials where possible, such as: Concrete: GGBS, 30% lower clinker content cement Steel: recycled steel, cross laminated timber Bricks and aggregates: reclaimed or recycled ▪ Use of alternative methods of concrete reinforcement where possible, such as fibre reinforcement, polymer reinforced concrete or glass reinforce plastic rebar ▪ Sourcing materials locally will be prioritised. This will help to reduce transport related CO_2 emissions and helps support local suppliers, further promoting economic sustainability; ▪ Re-use of materials on site e.g. excavated material; ▪ Specifying electrically powered plant and equipment where practicable and using grid connections for electric power when practicable instead of fossil fuel powered generators; ▪ Use of sustainably sourced HVO during construction where available.
Section 12.7.1 Construction stage mitigation Land Use Change	Most of the ground being disturbed during construction is agricultural grassland which has zero GHG emissions associated with it. However, in some of the key infrastructure areas, the land has been marked up as a potential location of biodiversity interventions in line with UÉ's policy of biodiversity net gain. Proposed mitigation strategies at Wherrew RWPS include soft landscaping measures such as amenity grassland, wildflower and woodland mix planting as well as salvage and reinstatement of disturbed areas. At Lisglennon WTP native hedgerows trees, scrub and wildflowers will be planted across a 18,068 m^2 area. In addition, at Bonniconlon BPS Evergreen trees and 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. Increased planting of trees and grasses on suitable lands will, over time, help to increase the carbon sequestration potential of the land and benefit the climate. Windy Gap BPT is located on blanket bog, the removal of which has the potential to release GHG emissions. However, as set out in Chapter 3 (Project Description) mitigation is in place to minimise disruption to the bog as follows:

Section Reference	Description
	▪ The peat layer will be carefully stripped, stored separately, and kept moist to preserve its structure and biological value. ▪ During the construction phase use of bog mats and low-pressure plant will be deployed to prevent rutting and compaction. ▪ After construction of structural elements, the original peat will be re-laid to its full depth and lightly compacted to match surrounding levels. Stored vegetation turves, if any, will be replaced on the surface, ensuring rapid habitat recovery. Any temporary drains or channels created during construction will be fully backfilled with peat to restore natural water flow. In terms of impact on the Proposed Development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments, method statements and good site management practise. The Contractor will also be required to mitigate against the effects of extreme wind/storms, temperature extremes through site risk assessments, method statements and good site management practise. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction.
12.7.2 Operational stage mitigation	The operational phase emissions are primarily caused by increased energy demand described in section 12.6.1.3.1. To mitigate this, solar panels are being installed at Bonniconlon and Lough Talt WTP and Lisglennon WTP. A combined total of 1,419 m^2 are due to be installed across the Proposed Development. The panels are expected to generate 207,911 kWh/yr based on the annual effective solar hours for County Mayo, which is 965 hours. The total operational carbon savings per year because of this is estimated to be approximately 46.5 tCO2e/yr. Further, GHG emissions associated with energy consumption will decrease through time in line with the Government's decarbonisation agenda.
12.10 Monitoring Requirements	Monitoring and reporting by the Appointed Contractor of the embodied carbon in the construction phase will be conducted. The aim of monitoring will be to seek further ways to minimise climate impacts. Monitoring will include contractual obligations, in line with the most recent Climate Action Plan 2026 and sectoral targets, for the successful tenderer to ensure that the Proposed Development stays in line with updated aims. Commitments to monitor GHG emissions during the construction phase will also be secured through the final Construction Environmental Management Plan (CEMP). Where monitoring shows that the Proposed Development is not meeting its targets, further mitigation will be put in place. Monitoring should also include reviewing potential for extreme weather events which may cause damage during construction. Contractors' Environmental Management System (EMS) will include measures to address risks during such events i.e. flooding.

21.9 Chapter 13 – Noise and Vibration

Mitigation and monitoring measures identified in Chapter 13 – Noise and Vibration are presented in Table 21-19.

Table 21-19 — Mitigation and monitoring measures – Noise and Vibration

Section Reference	Description
Section 13.7.1 Construction Phase	Best practice control measures for noise from construction sites are found within BS 5228 (2009 +A1 2014) Part 1. Construction noise impacts are expected to vary during the construction phase of the Proposed Development, this impact will depend on the distance between the construction activities and noise sensitive receptor. The Contractor will ensure that all best practice noise and control methods will be used, to ensure any negative noise impacts at off-site noise sensitive locations are minimised. The best practice measures set out in BS 5228 (2009) Part 1 includes guidance on several aspects of construction site mitigation measures, this includes the: ▪ selection of quiet plant and equipment; ▪ noise control at source of the noise; ▪ screening; and ▪ public liaison and communication plan.
Section 13.7.1.1 Construction Phase Noise	Construction mitigation is required across the Proposed Development site during construction works as predicted construction noise levels exceed the criteria set out by BS 5228-1 and TII guidelines for NSLs located within 50 m of construction works. Notwithstanding, the following standard noise commitments will be adhered to.
Section 13.7.1.1 Construction Phase Noise Selection of Plant and Equipment	The noise impact of all plant and equipment should be assessed prior to selection of the plant for the Proposed Development. Where an item of plant is identified as noisy with the potential to cause a negative noise impact it will be reviewed to check if there is an alternative quieter version of the same plant to undertake the same construction task.
Section 13.7.1.1 Construction Phase Noise Noise Control at Source	Where replacing a noisy item of plant is not viable or practical, consideration should be given to control that noise at source. This includes modifying the piece of plant or equipment to generate less noise, using dampening to control vibration induced noise or rattling. Example best practice mitigation measures to be considered are as follows: ▪ All plant and equipment to be switched off when idling. ▪ The use of white noise reversing alarms. ▪ Restriction on the dropping and loading of materials to less sensitive hours. ▪ The use of local screening for noisy activities or works with hand tools. ▪ Not dropping materials onto hard surfaces and using rubber mats etc for the dropping of materials. ▪ Ensure all plant and equipment is well maintained and cleaned, all lubrication should be in line with manufacturers guidelines.
Section 13.7.1.1 Construction Phase Noise Screening	Screening when used correctly can be an effective method of reducing the construction noise impact on the NSL's. The use of site hoarding and careful selection of areas for noise works, using buildings on the site, site offices and the building being constructed to screen noise from the works. Local screening of noisy works with the use of temporary acoustic barriers.
13.7.1.2 Construction Phase Vibration	This section sets out general recommendations for the control of vibration during the construction phase. Although no significant impacts are predicted due to distance separation, the following 'Best Practicable Means' (BPM) will be implemented as a precautionary approach:

	▪ Selection of Plant: Use of low-vibration equipment and techniques where possible (e.g. vibratory rollers will be restricted or managed when operating at their closest point to a dwelling). ▪ Plant Placement: Stationary vibration-generating equipment will be located as far as possible from the nearest NSLs. ▪ Monitoring: In the event of specific resident concerns, vibration monitoring may be conducted to ensure levels remain within the limits specified in BS 5228-2:2009+A1:2014. ▪ Communication: It is recommended that a public liaison officer should be put forward by the contractor to liaise with the local residents on matters relating to noise and vibration. Residents should be informed of any noise works scheduled where there is the potential to generate high levels of construction noise or if specialist works etc need to be conducted out of the working hours.
13.7.1.3 Construction Phase Traffic	This section sets out general recommendations for the control of construction traffic noise. Although no significant impacts are predicted, the following management measures will be implemented to minimise any potential disturbance: ▪ Construction Works Traffic Management Plan (CWTMP): A formal CWTMP will be implemented to manage the flow of HGVs and avoid convoys of vehicles. ▪ Restricted Hours: Deliveries and site traffic will be restricted to standard daytime working hours to avoid sensitive evening and night-time periods. There may be a need on specific occasions for deliveries to arrive outside of normal hours. In all such cases the applicant will liaise and agree any necessary derogations with local residents. ▪ Driver Conduct: Drivers will be briefed on minimising noise when approaching NSLs (e.g. avoiding unnecessary idling or heavy braking). ▪ Vehicle Maintenance: All construction vehicles will be regularly maintained to ensure they operate within legal noise limits.
13.7.2.1 Operational Phase Noise	To ensure compliance with the operational noise targets at NSLs, fixed mechanical assets—such as pumps and compressors—will be housed within dedicated, plant buildings. The structural, mechanical and architectural design of these facilities will incorporate the following building mitigation measures to maximise source attenuation and eliminate potential acoustic leakage.
Wherrew Raw Water Intake & Pumping Station (RWI&PS)	Operational phase noise associated with the proposed upgrades to the existing Wherrew RWI&PS will comprise the proposed fish return system, which will incorporate acoustic hoods, in addition to the existing plant and equipment on site, most notably the pumps associated with the existing pumping station. To ensure compliance with the operational noise criteria at the nearest Noise Sensitive Locations (NSLs), the fish return system will be housed within a fully enclosed, acoustically treated enclosure. The enclosure will be designed as a complete acoustic system, with appropriate treatment of access points, joints and any necessary ventilation openings, to minimise sound breakout from the enclosed fish return system. The enclosure specification will be confirmed during detailed design and shall provide acoustic performance at least equivalent to that assumed within the noise assessment.
Lisglennon Raw Water Storage & Pumping Station (RWS&PS)	Upgrade works at the Lisglennon Raw Water Storage & Pumping Station (RWS&PS) will include the replacement of the existing decommissioned pumps with two new pump sets within the existing pumping station building. As the new pumps will be fully enclosed within the existing building, operational noise impacts at nearby NSLs are expected to be negligible.

	Notwithstanding this, the following mitigation measures should be considered at the detailed design stage and incorporated into the existing pumping station building, where practicable, to further minimise potential noise breakout from the new pumping equipment: ▪ Building Envelope o Specify acoustically rated doors with suitable perimeter seals and drop seals. o Use acoustic glazing where windows are required for operational or health and safety purposes. o Ensure all windows and doors are fitted with effective compression seals to prevent noise leakage. ▪ Ventilation Openings and Louvres o Fit acoustic louvres to all ventilation openings to maintain airflow while reducing noise breakout. o Use acoustic attenuators or splitter silencers on mechanical supply and extract ventilation systems. o Design ventilation routes with bends or lined plenums to increase insertion loss. o Avoid direct line-of-sight paths between noisy equipment and external openings ▪ Internal Acoustic Treatments o Reducing reverberation can lower the internal sound pressure level and, consequently, reduce building breakout noise. o Install sound-absorbing wall and/or ceiling panels to reduce reverberant noise build-up within the pump house. ▪ Plant and Equipment Controls o Select low-noise pumps, motors and associated mechanical equipment where feasible. ▪ General Design Considerations o Locate the noisiest equipment as far as practicable from noise-sensitive façades and ventilation openings. o Orient acoustic louvres and doors away from nearby noise-sensitive receptors where possible. o Eliminate gaps and weak points within the building envelope, as small openings can significantly reduce the overall acoustic performance of the structure.
Lisglennon Water Treatment Plant (WTP)	The following mitigation measures should be considered at the detailed design stage and, where practicable, incorporated into the upgrade works at the Lisglennon WTP to further minimise potential noise breakout: ▪ Building Envelope o Provide dense masonry walls and an acoustically rated roof construction, with acoustic doors/windows where required. All service penetrations, joints and other potential gaps should be suitably sealed to minimise noise leakage. ▪ Ventilation o Provide acoustic louvres and/or attenuators to ventilation openings and mechanical ventilation systems, where required, to minimise noise breakout while maintaining adequate ventilation. ▪ Internal Acoustic Treatment o Provide sound-absorbing wall and/or ceiling treatments within plant areas, where required, to reduce reverberant noise levels and associated breakout.

	▪ Plant and Equipment o Where practicable, select low-noise pumps, motors and compressors and provide local acoustic enclosures for particularly noisy equipment where required. ▪ Equipment Location o Locate the noisiest plant as far as practicable from noise-sensitive façades and orient doors, louvres and other openings away from nearby NSLs.
13.7.2.1.4 Bonniconlon Booster Pumping Station (BPS)	The proposed Bonniconlon Booster Pumping Station (BPS) will comprise a new 320 kW booster pumping station incorporating a pumping area, control room and welfare facilities. An ESB medium-voltage (MV) substation and 400 kVA transformer will also be provided to supply the required electrical capacity. The proposed pumping equipment will be housed within the BPS building and, accordingly, operational noise effects at nearby NSLs are anticipated to be negligible. Notwithstanding this, the following mitigation measures should be considered during detailed design and incorporated into the proposed BPS, where practicable, to minimise potential noise breakout from the pumping equipment; ▪ Building Envelope o The proposed BPS building should comprise standard blockwork construction with appropriate acoustic criteria. o Acoustically rated doors should be provided with suitable perimeter and drop seals, and acoustic glazing should be used where windows are required for operational or health and safety purposes. o All windows, doors, service penetrations and other potential gaps should be effectively sealed to minimise noise leakage. ▪ Ventilation o Acoustic louvres should be provided to ventilation openings, with acoustic attenuators or splitter silencers incorporated into mechanical ventilation systems where required. o Ventilation routes should incorporate bends or acoustically lined plenums where practicable, while avoiding direct line-of-sight between noisy equipment and external openings. ▪ Internal Acoustic Treatment o Sound-absorbing wall and/or ceiling treatments should be provided where required to reduce reverberant noise levels and associated noise breakout from the pump house. ▪ Plant and Equipment o Low-noise pumps, motors and associated mechanical equipment should be selected where practicable. ▪ General Design Considerations o Noisy equipment should be located as far as practicable from noise-sensitive façades and ventilation openings, with doors and acoustic louvres oriented away from nearby NSLs where possible. o The building envelope should be designed and constructed to minimise gaps and weak points that could compromise its overall acoustic performance.
Section 13.7.2.1.5 Bonniconlon Reservoir	The proposed service reservoir near Bonniconlon will house treated water. As the site will not require any major mechanical plant, operational noise emissions are

	anticipated to be negligible and inaudible at the site boundary. Therefore no operational noise mitigation measures are required.
Section 13.7.2.1.6 Windy Gap Break Pressure Tank (BPT)	All site infrastructure and operational plant will be located below ground level. Consequently, the facility is expected to have no adverse impact on nearby NSLs, therefore no operational noise mitigation measures are required.
Section 13.7.2.1.7 Lough Talt Water Treatment Plant (WTP)	The existing Lough Talt site will be repurposed as part of the Proposed Development, with the majority of new and retained plant and equipment located internally within existing or proposed buildings. Based on the predicted operational noise levels, noise from the Lough Talt Water Treatment Plant (WTP) is not anticipated to result in a significant adverse effect at nearby NSLs. Notwithstanding this, the following mitigation measures should be considered at the detailed design stage, where practicable, to further minimise potential operational noise emissions: ▪ Building Envelope o Acoustically rated doors should be provided with suitable perimeter and drop seals, and acoustic glazing should be used where windows are required for operational or health and safety purposes. o All windows, doors, service penetrations and other potential gaps should be effectively sealed to minimise noise leakage. ▪ Ventilation o Acoustic louvres should be provided to ventilation openings, with acoustic attenuators or splitter silencers incorporated into mechanical ventilation systems where required. o Ventilation routes should incorporate bends or acoustically lined plenums where practicable, while avoiding direct line-of-sight between noisy equipment and external openings. ▪ Internal Acoustic Treatment o Sound-absorbing wall and/or ceiling treatments should be provided where required to reduce reverberant noise levels and associated noise breakout from enclosed plant areas. ▪ Plant and Equipment o Low-noise pumps, motors, compressors and associated mechanical equipment should be selected where practicable. ▪ General Design Considerations o Noisy equipment should be located as far as practicable from noise-sensitive façades and ventilation openings, with doors and acoustic louvres oriented away from nearby NSLs where possible.
Section 13.7.2.2 Operational Phase Vibration	▪ Plant Placement: Stationary vibration-generating equipment will be located as far as possible from the nearest NSLs. ▪ Any compressors, pumps and associated pipework shall be isolated from the plantroom facings (floor, wall and ceiling) by way of suitably selected vibration isolating measures. These measures should satisfy a natural frequency that is less than 2.5Hz in the slowest driving frequency (Fn= 2.5/RPM) of each piece of equipment with a minimum isolation efficiency of 90%. ▪ Plant and equipment should include vibration isolation such that the stated isolation efficiencies are achieved. ▪ All pump sets should be provided with concrete inertia bases with a weight at least 1.5 times the weight of the pumps they are supporting. Pumps should be mounted in pairs (running and standby) on the same slab-base. The inertia bases should

	be designed with sufficient strength and rigidity to support the equipment and compensate for dynamic reaction due to the equipment.
Section 13.7.2.2 Operational Phase Vibration	▪ All pump sets should be provided with open-coil spring anti-vibration mountings under the inertia bases. These should be provided with neoprene noise stop pads at least 6mm thick. The effective isolation efficiency of the installed anti-vibration mounts should be as shown in Table 21-20.

Table 21-20 – Pump Vibration Isolation Requirements

Details	Suspended Concrete Floor	Solid Floor
Pumps > 5hp	98%	96%
Pumps < 5hp	96%	94%

- With the anti-vibration mountings fully deflected under the weight of the plant, there should be a minimum clearance of 18 mm from the underside of the inertia block to structural floor.
- All smaller in-line type pumps should only be fixed to the structure by isolated fixing bolts.
- All pipe work from pumps should be supported for a distance equivalent to 100 pipe diameters, using neoprene hangers giving a minimum static deflection of 8mm under the imposed load. Pipe work should also include suitable flexible connectors.

Section 13.10.1 Construction Phase

To ensure continuous compliance, noise and vibration monitoring will be carried out throughout the construction phase:

- Noise Monitoring: monitoring will be conducted at noise sensitive receptor locations to ensure construction site activities remain within the established TII Guidance limits.
- Vibration Monitoring: Monitoring will be undertaken to ensure vibration levels, measured in Peak Particle Velocity (PPV), do not exceed thresholds for cosmetic or structural protection of neighbouring buildings.

The Appointed Contractor will carry out noise monitoring at NSL during construction phases at the static sites to assess the effectiveness of noise control measures. Noise monitoring will be carried out by a qualified acoustics specialist using a calibrated noise meter. Noise monitoring will follow the ISO 1996-1:2016 Standard Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures. Data will be compare to the TII Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004). Where construction noise exceeds the recommended levels, the Appointed Contractor will review the noise control measures at the site and upgrade. The effectiveness of the upgrade of the mitigation measures will be verified by further noise monitoring at the site boundary and the nearest noise sensitive location.

If a noise complaint is received from a resident, the Environmental Manager will record the date and time of the complaint. A record will be maintained of the complaints raised by residents, including date and time of the noise, and any other details received from the complainant. The Appointed Contractor will immediately review the noise control measures at the site and upgrade. The effectiveness of the upgrade of the mitigation measures will be verified by further noise monitoring at the site boundary and the location of the complainant. The upgrades in noise mitigation measures will be communicated (either letter or electronically) to the complainant.

	The Environmental Manager will maintain records of all correspondence received and communicated to complainants.
Section 13.10.2 Operational Phase	Following completion of the construction works and commencement of operations at the various water infrastructure sites, a compliance noise survey should be undertaken at the nearest NSLs during the night-time period (23:00–07:00). The survey will verify that operational noise levels from the water infrastructure sites comply with the relevant EPA NG4 night-time noise criteria.

21.10 Chapter 14 – Resource and Waste Management

Mitigation and monitoring measures identified in Chapter 14 – Resource and Waste Management are presented in Table 21-21. As no significant negative operational effects of the Proposed Development on material assets are identified, no operational mitigation or monitoring measures are required.

Table 21-21 — Mitigation and monitoring measures – Resource and Waste Management

Section Reference	Description
Section 14.6.1 Mitigation measures for waste during Construction Phase	The Appointed Contractor will follow the waste hierarchy which prioritises waste prevention and minimisation, followed by reuse, recycling/recovery, energy recovery (e.g. incineration), and lastly, disposal. All contractors are legally required to manage waste in compliance with the Waste Management Act 1996 as amended and relevant legislation, ensuring it is stored, transferred, treated, and disposed of safely during the Construction Phase. Waste management must not endanger human health or the environment. This includes risks to water, air, soil, flora, fauna, or nuisance due to noise or odour.
Section 14.6.1 Mitigation measures for waste during Construction Phase	A Construction and Environmental Management Plan (CEMP) has been prepared for the Proposed Development. The CEMP has outlined standard operating procedures for the management of waste at the site. The Appointed Contractor will be responsible to ensure that the requirements of the CEMP and the Resource and Waste Management Plan (RWMP) and waste legislation, programmes and policies are implemented. The Appointed Contractor will be responsible for preparing a site-specific CEMP. As a minimum the site-specific CEMP will include the mitigation and monitoring measures given in Chapter 21 of the EIAR.
Section 14.6.1 Mitigation measures for waste during Construction Phase	Key design approaches and initiatives were identified throughout the design and planning stage to minimise waste production and optimise material recovery where feasible. The Contractor will ensure that the following initiatives are relevant to the final design and construction phases of the Proposed Development: ▪ Management of construction waste at the sites and the Contractors Compounds will be in compliance with relevant legislation and best practice. Its primary goal is to promote efficient resource use, minimise waste generation, and reduce landfill disposal in line with the waste hierarchy. ▪ Waste generated during construction will be managed in accordance with the Waste Framework Directive and a minimum of 70% by weight of the C&D waste generated (excluding soil and stone) will be reused, recycled or subject to material recovery. Surplus excavated material generated during construction, where suitable, will be reused on site or in other parts of the Proposed Development.

Section Reference	Description
	▪ The Appointed Contractor will be required to maximise the use of secondary or recycled aggregates in line with tender specifications. Virgin aggregates shall only be employed where secondary aggregates do not fulfil UÉ's structural requirements and/or are unavailable. Reuse of topsoil and subsoil excavated during the installation of the water main will be maximised where possible. The reuse of topsoil and subsoil for land reclamation or agricultural benefit will be explored by the Contractor. ▪ In line with the Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects (EPA,2021), a Waste Management Coordinator (WMC) will be appointed by the Contractor. This role may be fulfilled by different individuals throughout the project lifecycle but must be assigned to a technically competent and appropriately trained member of the Contractors team. ▪ The Contractor will prepare and finalise a Resource and Waste Management Plan (RWMP) for the Proposed Development in accordance with Section 5.5 of the UÉ Circular Economy Design Standard (CEDS). ▪ The WMC will be responsible for ensuring compliance with the objectives and measures outlined in the Contractors RWMP and is granted the necessary authority to do so. ▪ The Appointed Contractor will be required to prepare a Demolition Plan in advance of each building or structure to be demolished at the Lough Talt WTP site. ▪ The Waste Management Coordinator (WMC) will be responsible for carrying out training for sub-contractors and site inductions. All site personnel will receive a comprehensive environmental and waste management training prior to commencing work. This induction will include information on resource and waste management aligned with the Resource & Waste Management Plan (RWMP). The training will be tailored to the roles and responsibilities of all personnel, from management to site operatives. Key control measures, such as refuelling procedures and storage of oil, fuel, and chemicals—will be clearly communicated to ensure compliance with site-specific environmental requirements. ▪ The WMC will be responsible for preparing a RWMP Implementation Review Report at project handover. ▪ The WMC will be responsible for the compliant management of all waste generated by construction activities and will be responsible for preparing and implementing a Construction Environmental Management Plan (CEMP), identifying construction methodologies for the Project and standard operating procedures that will be implemented to minimise the impact. The CEMP will include all mitigation measures as outlined in the EIAR and all relevant planning conditions. ▪ Circular economy principles will be incorporated within the management of materials during the Construction Phase in order to reduce the amount of materials used and waste generated by the Proposed Development. ▪ The WMC will ensure that any facilities to which waste or by-product is brought are licensed / permitted / registered in compliance with waste management legislation. Similarly, the transportation of waste away from any of the construction sites or compounds will be carried out by vehicles in possession of Waste Collection Permits in compliance with legislation. ▪ Surplus material, for example clean soil and stone, classified as a by-product will be notified to the Environmental Protection Agency via EDEN in advance of

Section Reference	Description
	removal off site. Material will not be removed until a decision of the notification is received from the EPA. ▪ The WMC will retain notifications to the EPA. These will be made available to Uisce Éireann on request and shall be uploaded to the Uisce Éireann's Waste Tracker. ▪ The Contractor(s) will also be responsible for management of the ordering of supplies, ensuring that supplies are ordered as needed to avoid over-ordering or the requirement for long-term storage of materials, thus reducing the potential for damage or expiration of supplies while being stored on site. ▪ The WMC will be required to complete Uisce Éireann's Waste Tracker. Monthly waste management reports will be provided to the Site Manager and Uisce Eireann. The Contractor will classify the material as non-hazardous or hazardous. Non-hazardous materials shall be divided into various categories, for example soil & stone (tonnes/m^3), steel (tonnes), timber (tonnes), clean block and brick (m^3), blacktop/asphalt (tonnes/m^3) if post 1980. Hazardous wastes can be divided for example into contaminated soil (tonnes/m^3), fuels (litres), blacktop/asphalt (if pre-1980) (tonnes/m^3) etc. ▪ All waste transport and disposal / recovery must be carried out in accordance with relevant waste management legislation (outlined in Section 14.2 of Chapter 14) and any subsequent future legislation which may apply. The Waste Management Coordinator, nominated by the Contractor, will be responsible for ensuring correct tracking and documentation procedures are undertaken for all waste removed from site during the project. Each consignment of waste removed from site will be tracked and recorded. A site record detailing the date, truck registration, waste type, estimated volume and destination will be filed onsite for each consignment, along with the corresponding truck docket and weighbridge record at the offsite disposal / recovery destination. A copy of the relevant waste collection permits and waste permit / waste licence for the relevant disposal / recovery facilities will be available onsite for the duration of the project. ▪ Waste materials will be segregated onsite into the various waste streams, via. dedicated labelled skips and storage areas. All waste will be removed from Site by one or more waste haulage contractor(s) who hold a current valid waste collection permit issued by the National Waste Collection Permit Office (NWCPO). All waste materials generated during the construction phase will be removed offsite to an appropriately permitted or licenced waste disposal / recovery facility. All waste removed offsite will be appropriately characterised (under the correct LoW / EWC code), transported and disposed of in accordance with relevant waste management legislation (including but not limited to the Waste Management Act of 1996, 2001 and 2003 and all subsequent waste management regulations as amended). All waste management and disposal / recovery records will be maintained onsite throughout the project and will be uploaded to UÉ's Waste Tracker on a monthly basis.
Section 14.6.1 Mitigation measures for waste during Construction Phase	The use of trenchless methods e.g. HDD for river/stream crossings will reduce the quantity of material excavated and consequently reduce the amount of waste that will be generated during pipe installation.

Section Reference	Description
Section 14.6.1 Mitigation measures for waste during Construction Phase	The site investigation identified the presence of rock close to the surface at the site of the Lisglennon WTP. The Contractor will assess the suitability of the rock for reuse on site or at another site within the redline boundary of the Proposed Development.
Section 14.6.1 Mitigation measures for waste during Construction Phase	In the event that hazardous waste is encountered during the construction of the Proposed Development, it will be managed as per the Waste Management (Hazardous Waste) Regulations 1998 (as amended) (S.I. No. 163 of 1998) and other applicable legislation. Hazardous waste, such as contaminated soil or waste fuels, will be stored on-site only temporarily and removed regularly. Storage will be managed to minimise exposure risks and environmental impacts. Hazardous waste will be recovered where possible or otherwise disposed of appropriately. Any hazardous waste will be stored separately to non-hazardous waste, with individual hazardous waste streams segregated from each other. Appropriate signage will be put in place to denote hazardous waste storage locations. Contaminated land excavated will be removed by licensed waste carriers to a suitably licensed facility. Treatment options for hazardous waste reuse and recovery will be explored, depending on the nature of the waste and its hazardous properties. All hazardous waste which cannot be treated will be disposed of through a suitably licensed waste contractor at a suitably licensed/permitted facility which can accept hazardous waste. As per legislative requirements, records of all hazardous waste generated and removed from site will be retained by the WMC for a minimum period of three years by the appointed Contractor(s). This includes documentation such as Waste Transfer Forms, any applicable Transfrontier shipment records and any records on the treatment or ultimate disposal of the hazardous waste. All site personnel will receive a comprehensive environmental and waste management training prior to commencing work. This induction will include information on resource and waste management aligned with the CEMP, and the RWMP.
14.6.2 Article 27 By Products and Article 28 End of Waste	It is estimated that 96,000 tonnes of surplus soil and stone and 17,683 tonnes of peat will arise during the construction of the Proposed Development. Based on the geotechnical testing carried out at the site, it is likely that surplus soil and stone and rock will be predominately clean and suitable for reuse as landscaping or non-structural fill. The site investigations and laboratory tests have shown that the soil and stones at the site is inert/non-hazardous. This classification of the material will allow this material not to be classed as a waste, if taken off site, but as a by-product that can be used elsewhere. The Appointed Contractor will be required to manage the excavations in a manner that follows the waste hierarchy (Figure 14 1) and to investigate opportunities to reuse surplus excavated soil and stone and peat on site before removing it off site under an Article 27 (By-products) or Article 28 (End of Waste) process (see Section 14.2.1 and Section 14.2.2 respectively). Table 14-14 estimated that 13,675 m3 (24,615 tonnes) of surplus soil and stone is non-hazardous. If the Contractor identified on site use for this material during construction it would reduce the quantity of surplus material going off-site. This would have a consequential benefit for the waste handling capacity of waste management facilities in County Mayo and Sligo and would help them maintain waste acceptance capacity at their sites. Reuse of this material on site would reduce the waste acceptance

Section Reference	Description
	capacity of the waste management facilities to 5%, and change the effects assessment to Slight Significance.
14.6.2 Article 27 By Products and Article 28 End of Waste	Surplus greenfield soil and stone generated during construction of the Proposed Development will be managed in accordance with the EPA's National By-Product Criteria BP-N002/2024 as amended, where suitable. Brownfield soil and stone will be managed in accordance with Article 27 or at an EPA licenced Soil and Stone Recovery Facility (see Appendix 14-2 for a list of suitable sites in County Mayo and County Sligo). This will allow the subject materials to be used without becoming legally defined as a waste and will be pursued as a priority as waste 'prevention' is preferable in the waste hierarchy. This approach also supports a circular economy approach and is aligned with the UÉ Sustainability Framework including an ambition to "embed circular economy principles in all capital projects". Specifically, it includes a target of "zero recoverable waste to landfill by 2030 ". Prior to works, the EPA will be notified of the by-product decision and intent for the use of Article 27 for any non-greenfield site material. Notifications must be submitted online using the Environmental Data Exchange Network (EDEN) online portal. This allows the EPA to maintain a register of by-product notifications which are available for public inspection online to include details of origin and destination sites for soil and stone by-product.
14.6.2 Article 27 By Products and Article 28 End of Waste	The Appointed Contactor will assess other major projects in the area at the time of construction to see if excavated material can be used in these projects. The excavated material must meet the criteria set out in the EPA's (2019) Guidance on Soil and Stone By-Products, and the National By-Products Criteria for Greenfield Soil and Stone (BP-N002/2024) in order to be classified as a by-product. The EPA has released a Position Paper Regulation 27 Consultation to inform development of Draft Guidance for Brownfield soil and stone by-product material incorporating a PFAS screen. The Appointed Contractor shall follow the guidelines and limits provided in this guidance document when removing brownfield soil and stone from the site.
14.6.2 Article 27 By Products and Article 28 End of Waste	For by-product material that has originated from greenfield sites, either Mayo County Council or Sligo County Council will be informed through registration using the EPA EDEN portal via the 'By-Products Module'.
14.6.2 Article 27 By Products and Article 28 End of Waste	Based on the Proposed Development and the estimated quantities of surplus excavated soil and stone it is assumed that as a minimum, the Article 27 by-product mechanism will divert 70% of excavated soil and stone and excavated rock from landfill.
14.6.2 Article 27 By Products and Article 28 End of Waste	Site won bitumen will be managed in accordance with EPA's National By-Product Criteria (BP-N001/2023). The WMC will be responsible for notifying the EPA via the EDEN site. The WMC will maintain records on the quantities of bitumen leaving the site. The bitumen will be transported by a permitted waste haulage contractor to a licenced Reclaimed Asphalt Pavement (RAP) site. Waste acceptance dockets will be kept and filed by the WMC and will be made available for review by Uisce Éireann or their Agents. The WMC will complete UÉ's electronic Waste Tracker and submit the records to UÉ monthly. These records will form part of the Post Construction Waste Management Report that will be submitted to Uisce Éireann at the end of the contract.
14.6.2 Article 27 By Products and	Concrete and other suitable waste streams will be taken off site to an Article 28 End of Waste site/facility where the site is within a reasonable distance from the

Section Reference	Description
Article 28 End of Waste	construction site. The WMC will be responsible for notifying the EPA via the EDEN site.
14.6.2 Article 27 By Products and Article 28 End of Waste	The Proposed Project will require the excavation of peat deposits at Windy Gap BPT and sections of the pipeline between here and the Lough Talt WTP will be managed as a valuable resource for beneficial use rather than disposed of. Surplus peat resources following reinstatement along the trunk main will be made available to Bord na Móna for beneficial end-use such as peatland rehabilitation or peatland restoration and thereby will not become wastes.
14.6.2 Article 27 By Products and Article 28 End of Waste	The UÉ Sustainability Framework includes an ambition to “embed circular economy principles in all capital projects”. Specifically, it includes a target of “zero recoverable waste to landfill by 2030” and an initiative around the “use of more sustainable materials … switching to circular business model approach”. The use of Article 27 and Article 28 for managing surplus materials generated during construction will support Uisce Éireann’s sustainability goals.
14.6.3 General Site Maintenance	A number of waste management practices will be implemented by the Appointed Contractor in order to manage waste arisings in an orderly manner to minimise the effects in so far as is possible: • A regular programme of site tidying will be established to ensure a safe and orderly site; • Debris netting will be erected to prevent materials being scattered by the wind; • Food waste will be strictly controlled on all parts of the site in order to minimise the attraction of vermin and other pests; • In the event of any litter or debris escaping the site, it will be collected immediately and removed to storage on site, and subsequently recovered / disposed of in the normal manner; • Waste receptacles such as skips will be labelled and secured so as to minimise impact from fly-tipping; • Waste will be collected in a timely fashion so as to prevent overly large volumes of waste accumulating; • Provision of a site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage and welfare facilities; • Waste and chemical inventories will be developed/recorded/updated; • Details of site managers contact numbers and public information signs (including warning signs) will be provided at the boundaries of the working areas. Any complaints from the public regarding waste and housekeeping will be entered in the complaints register and actioned as required; • Provision of appropriate waste management facilities at each working area and regular collections to be arranged; and, • No bonfires or burning of waste materials will take place. Inspections of construction activities will be carried out by the Contractor on a daily basis to ensure all necessary waste management measures relevant to the construction activities are being effectively implemented by construction staff, ensuring legal and contractual conformity.
	Daily Inspections:

Section Reference	Description
	The daily inspections should include, but not be limited to, checking that: • The site boundary is marked out and respected; • All waste is appropriately stored and segregated; • Waste skips are covered to prevent wind-blown litter; • Drip trays are in place for all stored equipment and plant; • All chemicals/fuels are stored with appropriate containment/bunds/cover; • Construction noise is within permitted limits and does not create a nuisance; • Dust does not create a nuisance; and, • Fencing/hoarding is secure.
	Weekly Inspections The inspections should include, but not be limited to confirming that: • Daily checklists have been completed; • Waste storage areas have been checked and there is no build-up of waste materials; • Spill kits have been checked and contain all relevant materials; • The performance of all pollution control equipment has been checked and the equipment is working effectively; • Noise reduction/monitoring equipment has been checked and is operating effectively; • Temporary septic tanks are not overfull/discharging; and, • Special control measures identified in any relevant Permit/Planning Conditions and RWMP are adhered to. A register will be kept of all inspections conducted by the WMC to facilitate monitoring of any key performance indicators and to measure progress against any waste management performance targets that may apply.
14.6.4 Site Compounds and Temporary Working Areas	Indicative Site Compound locations and temporary working areas (TWAs) will be required during construction 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 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. • 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. • All site compounds and associated TWAs will be included within the Red Line Boundary.

Section Reference	Description
14.6.5 Communications	The following communication tasks are recommended for the Contractors Waste Management Co-ordinator (WMC) throughout the construction phase: • Internal Reporting: Regularly report resource usage statistics and performance against targets to UÉ and the Contractor management. These updates should be a standing agenda item at site meetings; • Regulatory Engagement: Liaise with Mayo County Council, Sligo County Council and the EPA during site inspections or enforcement audits. All corrective actions must be documented and reported accordingly; • Stakeholder Communication: Engage with external stakeholders, including the local authorities, the EPA, NPWS, IFI and the public, as appropriate, regarding on-site resource management practices particularly at the main compound and the individual site compounds; and, • Final Reporting: Upon project completion, the Appointed Contractor will prepare a comprehensive report detailing resource management outcomes, including reuse and recovery rates and final destinations of off-site materials. This report must be submitted to the UÉ, Contractor management, and the local authorities. The local authority may require formal sign-off as a condition of planning compliance. The Contractor will prepare a Post Construction Waste Management Report. The report will contain details of all wastes generated and removed from the site during construction. Wastes shall be classified as non-hazardous and hazardous and details on the volumes of waste that were sent for re-use/recycling, as byproduct or end of waste shall be provided. The Contractor will provide details on the final waste acceptance/disposal sites used during the contract and the associated waste types and volumes transported to these sites. Evidence of the volumes/weights and types of waste delivered to these sites shall be provided in the form of waste acceptance receipts or landfill site dockets.
14.6.6 Mitigation Measures for Resource use during Construction	The UÉ Sustainability Framework includes an ambition to “embed circular economy principles in all capital projects”. Specifically, it includes a target of “zero recoverable waste to landfill by 2030” and an initiative around the “use of more sustainable materials … switching to circular business model approach”. To support these requirements, the Contractor will, where possible, ensure all products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled, where possible. As per the EPA (2021) guidelines ‘consider material efficiency for the duration and end of life of a building project; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction’. The Contractor will prepare a Resource Waste Management Plan (RWMP) for the Proposed Development as per Section 5.5 of the UÉs Circular Economy Design Standard. The RWMP will clearly align with UÉs sustainability ambitions e.g. zero recoverable waste to landfill. The content of the RWMP will include: ▪ Introduction and Background ▪ Project Description ▪ Roles and responsibilities ▪ Design approach including the management of materials outlined in the Article 27 By-Products & End of Waste section.

Section Reference	Description
	▪ Key Materials and Quantities ▪ Site Infrastructure ▪ Materials Management ▪ Reporting Requirements (UÉs Waste Tracker IDD-FM-06) and auditing protocols. Where possible materials will be re-used/recycled to reduce the need for procurement of new materials. In accordance with the UÉ Sustainability Strategy Interim the Contractor will consider circular solutions at each phase in the UÉ capital projects. When selecting suppliers, the Contractor(s) will evaluate their technical capabilities to ensure they can meet the project's requirements. This helps eliminate unsuitable candidates early and provides suppliers with a clear understanding of UÉ's sustainability priorities and submission expectations. Where possible, the Contractor will seek to maximise the use of prefabricated structures and components where feasible, encouraging a process of assembly rather than construction.
	The Contractor will be responsible for sourcing materials for the construction phase of the Proposed Development. Contractors will seek to engage with local suppliers for aggregates, concrete and stone. This will support UÉs Sustainability Goals. Specialist equipment such as pumps and dosing systems are more likely to be supplied by specialist manufacturers. Table 21-22 provides information on the numbers of suppliers for primary resources in County Mayo. **Table 21-22 — Construction Material outlets in County Mayo** **Material** / **Number of facilities in County Mayo and Sligo** Ready-Mix: 9 Precast Concrete: 9 Concrete Blocks: 10 Aggregate: 9
14.7.1 Monitoring during the construction phase	The Construction RWMP (AtkinsRéalis, 2026) prepared as part of this planning application states the Appointed Contractor will be responsible for maintaining waste records and documentation for the full duration of the construction phase. The Contractor will track and monitor all waste volumes transported offsite. All waste records will be maintained onsite throughout the project and the WMC will be responsible for updating Uisce Éireann's Waste Tracker on a monthly basis. Compliance with the requirements of the Construction Environmental Management Plan will be a requirement throughout the project construction phase. Environmental monitoring and reporting requirements as per the grant of planning will be the responsibility of the Contractor.

21.11 Chapter 15 – Roads, traffic and transportation

Mitigation and monitoring measures identified in Chapter 15 – Roads Traffic and Transportation are presented in Table 21-23. No specific operational-phase mitigation measures or monitoring requirements are proposed for the Proposed Development as part of the operational phase

Table 21-23 — Mitigation and monitoring measures – Roads, Traffic and Transportation

Section Reference	Description
15.8.1 Construction Phase Mitigation	The details of the CWTMP will be agreed with the roads department of the Local Authority(ies) in advance of construction activities commencing on-site. The site actions that could be undertaken to overcome traffic management issues are discussed below. A Preliminary CWTMP has been submitted as Appendix 15-1, Volume 3 of this EIAR.
	The Appointed Contractor will manage the effect of construction traffic through the provision of controlled access points to the site. These will be carefully coordinated to minimise conflicts with other activities and road users. A list of measures which may potentially be adopted during the construction works which are also typically included in a detailed CWTMP are as follows: - (Note: this is not an exhaustive list, and it will be the Appointed Contractor's responsibility to prepare a detailed CWTMP to be approved with the Planning Authority prior to commencement of construction). ▪ Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access. ▪ A road condition survey will be undertaken by the Contractor prior to the commencement of earthworks. The Contractor will ensure that any damage attributable to the construction works is repaired and that affected roads are reinstated to their original condition upon completion of the works. ▪ Construction and delivery vehicles will be instructed to use only the approved and agreed means of access and movement of construction vehicles will be restricted to these designated routes. ▪ Restriction of HGV movements during drop off and pick up times associated with the schools. ▪ Appropriate vehicles will be used to minimise environmental effects from transporting construction material, for example the use of dust covers on trucks carrying dust producing material. ▪ Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site. ▪ Parking of site vehicles will be managed, and will not be permitted on public roads, unless proposed within that designated area that is subject to traffic management measures. ▪ A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public road leading away from the construction site. ▪ Reasonable access to all local residents, and businesses will be maintained with the use of traffic management measures, including priority-controlled traffic flow, give and take arrangements, and where necessary, temporary road closures with signed diversion routes.

Section Reference	Description
	▪ On site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to avoid any potential for debris on the local roads. ▪ A combination of 'Stop/Go' system and road closures and diversions will be utilised as agreed with the council. 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. An example of a 'Stop/Go' system and traffic light system are presented in Figure 21-3, and Figure 21-4 below. ▪ Construction vehicle movements will be coordinated to avoid peak traffic periods and school's pickup/drop off periods wherever practicable, with the majority of operations scheduled during off-peak hours—typically between 09:00 and 17:00 from Monday to Friday, and 09:00 and 13:00 on Saturdays. This approach is intended to minimise potential effects on sensitive receptors along the expected construction works corridor, including schools, medical centres, and other community facilities. ▪ In the event that road closures or diversions are required, alternative routes will be reviewed and assessed to ensure their suitability prior to implementation. ▪ Appropriate coordination will be maintained with nearby committed developments should construction activities coincide, and any disruption to the road network and nearby road users will be managed in an efficient and timely manner. ▪ Where a vehicle would be unsuitable on the public road, these would be transported by Ordinary Goods Vehicle Type 2 to designated access/egress points which are gateways to the working areas. ▪ All vehicles will be suitably serviced and maintained to avoid leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. All scheduled maintenance carried out off site will not be carried out on the public highway; and, ▪ Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footway. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users and mobility impaired persons. The above measures will minimise any significant environmental degradation or safety concerns in the vicinity of the proposed works, due to the presence of construction traffic. Furthermore, it is in the interest of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of expected corridors, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

21.12 Chapter 16 – Material Assets

Mitigation and monitoring measures identified in Chapter 16 – Material Assets are presented in Table 21-24. Embedded mitigation is within the Proposed Development as outlined in Chapter 3 of the EIAR. Where avoidance was not possible, like for example laying of the pipeline close to existing services along the road network, steps will be taken by the Appointed Contractor to identify and avoid underground services.

Table 21-24 — Mitigation and monitoring measures – Material Assets

Section Reference	Description
Section 16.6.1.1 Separation Distance	The proposed works are generally located away from existing utilities where known, to protect the existing and proposed assets. Where existing utilities need to be crossed by the proposed utilities, minimum separation distances will be maintained in accordance with the relevant utility standard guidelines. Where it is not possible to construct proposed works without intervening with the existing utilities, it is proposed to divert/relocate the existing utilities in coordination with the stakeholder and in line with the relevant guidelines. In all instances separation distances and exclusion zones will be maintained. The Appointed Contractor will use the relevant standard guidelines for utilities are as below: ▪ Code of Practice for Avoiding Danger from Underground Services (HSA); ▪ Code of Practice for Avoiding Danger from Overhead Electricity Lines (ESB); and ▪ Code of Practice for Water Infrastructure (Water).
Section 16.6.1.2 Road Maintenance	Where the proposed works are in road sections, permanent reinstatement will be carried out in accordance with "Guidelines for Managing Openings in Public Roads" Department of Transport, Tourism and Sport April 2017 (Rev 1). For proposed works in road sections, the Reinstatement schedule, and traffic management measures will be agreed with the Mayo County Council and Sligo County Council. Where there are planned road works by Mayo County Council or Sligo County Council, the relevant Local Authority will be consulted, and a construction strategy will be agreed with the local authority and Uisce Éireann, prior to construction in those road sections.
16.6.1.3 Traffic Management	During the construction phase, traffic will be managed via the implementation of the Traffic Management Plan which will be prepared by the Contractor, in accordance with the Outline Traffic Management Plan which is submitted with this planning application. Further details are included in Chapter 15 – Traffic, Roads and Transportation of this EIAR.
16.6.1.4 Watercourse Crossings	There are approx. 30 surface water feature crossings which have been identified along the pipeline route, comprising of approx. eighteen number of EPA-identified watercourses and twelve number of field drains. These are described in Chapter 7 Biodiversity and Chapter 10 Water and Hydrology. 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, the Proposed Development will instead connect to the existing 450 mm diameter pipeline that crosses the River Moy.
16.6.1.5 General Construction Measures	▪ A project-specific Detailed Construction Environmental Management Plan (CEMP) will be prepared by the Appointed Contractor prior to the commencement of construction works. This document will take account of all of the environmental considerations (including water, dust and noise nuisance control, soil / stockpile management, temporary groundwater management, appropriate site management of compound area, fuel, oil and chemical storage and use; and waste management) set out in the CEMP submitted as part of this planning application;

Section Reference	Description
	▪ The construction compounds will include adequate temporary welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the compound will be removed off site to an appropriately licensed facility for disposal for the duration of the construction and commissioning phase; ▪ All newly installed utilities/ services will be assessed, tested and certified as required prior to being fully commissioned; ▪ All works associated with the existing utilities for the Proposed Development will be carried out in strict accordance with the guidelines of the relevant stakeholders (specifically ESB, and Uisce Éireann), Health and Safety Authority and any additional site-specific requirements; ▪ A copy of all available existing, and as built utility plans will be maintained on Site during the construction of the Proposed Development; ▪ Any underground utilities including but not limited to power lines, water mains, foul sewers, storm sewers, ESB, telecommunication assets and Uisce Éireann services, located within the red line boundary of the Proposed Development will be clearly marked and all construction personnel will be made aware of the known location of any onsite underground or over ground services during the construction phase; ▪ The permanent connection to serve the development will follow an agreed methodology, with full notification to existing Uisce Éireann customers affected by short-term water supply interruptions during connection. Contingency plans, such as backup network supply, will be implemented where feasible to minimize disruptions during relocation or diversion works, with users informed in advance; ▪ Any shutdowns required to connect new and existing water infrastructure will be agreed in advance with Uisce Éireann and the local authority; and ▪ Where access tracks within private lands are not possible along the route, work areas will be reinstated with excavated soil and either seeded with native species, allowed to vegetate naturally or reinstated with excavated grass turves and will be restored to their original condition.
Section 16.10.1 Monitoring during the construction phase	▪ The Contractor will be responsible for maintaining records and documentation for the full duration of the demolition and construction phase, including all relevant paperwork during commissioning of new services, consisting of required approvals and consents, and documentation for each system being commissioned (i.e. completion reports, checklists, test results, utility provider confirmation, and operations and maintenance manuals).

Table 21-25 — Operational phase mitigation and monitoring measures – Material Assets

Section Reference	Description
Section 16.6.2.1 Built Services	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

Section Reference	Description
	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. 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 (see Chapter 7 Biodiversity, Chapter 8 – Agronomy and Chapter 10 – Water (Hydrology and Hydrogeology). 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 (see Section 3.9 of Chapter 3 – Project Description).

21.13 Chapter 17 – Cultural Heritage

Mitigation and monitoring measures identified in Chapter 17 – Cultural Heritage are presented in Table 21-26.

Table 21-26 — Mitigation and monitoring measures – Cultural Heritage

Section Reference	Description
Section 17.7 Mitigation measures	The current state policy as detailed in the Framework and Principles for the Protection of the Archaeological Heritage (1999), is that preservation *in situ* of archaeological material is the preferred option. Where this cannot be achieved then appropriate measures need to be adopted to ameliorate the impacts that the Proposed Development may have on features of archaeological, architectural and/or cultural heritage within the study area during both the construction and operational phases of the works. Following consultations with the DHLGH, it was recommended that a Post Consent Advance Stage Works be implemented.
Section 17.7 Mitigation measures	Pre-Construction/Post Consent Advance Works Stage will include: ▪ Archaeological testing at the site of the new Windy Gap BPT. ▪ Archaeological testing at the Bonniconlon BPS.

Section Reference	Description
	▪ Archaeological resolution of ditch feature (CH127) encountered during archaeological testing. ▪ Architectural Survey of ruins of structure (CH054). The testing will be undertaken by a suitably qualified archaeologist working under licence as issued by the minister (DHLGH) under section 26 of the National Monuments Acts (1994-2014). In the event of archaeological features, finds and/or deposits been encountered during the course of the testing, the relevant authorities should be notified immediately. *Preservation by record* (through archaeological excavation) will only occur if it is established that *preservation in situ* cannot be achieved, and such excavations are agreed with National Monuments Service.
Section 17.7 Mitigation measures	Archaeological monitoring of topsoil stripping will be undertaken in the area surrounding CH127 (ditch feature). This will be undertaken by a suitably qualified archaeologist working under licence as issued by the minister (DHLGH) under section 26 of the National Monuments Acts (1994-2014). In the event of archaeological features, finds and/or deposits been encountered during the course of the monitoring, the relevant authorities should be notified immediately. Preservation by record (through archaeological excavation) will only occur if it is established that preservation in situ cannot be achieved, and such excavations are agreed with National Monuments Service.
Section 17.7 Mitigation measures	The following mitigation measures will be implemented during the construction phase: Archaeological monitoring of all groundworks in greenfield areas, including the 2.5 km sections that travels across farmland in the townlands of Lisglennon and Ballinteean and at the ruins of a structure (CH054). ▪ 1 km section across farmland in the townlands of Behy More and Corimla South; ▪ 1.5 km section of the old roadway between Tobercurry and Bonniconlon that is also part of the walking route; ▪ 500 m section of pipeline will travel through the designed landscape and forestry surrounding Belleek Manor; ▪ Archaeological monitoring along the roads within the zones of notification of five recorded monument; ▪ Archaeological monitoring at townland boundary sites; ▪ Archaeological monitoring at culverts and possible culverts (CH064, CH115, CH121-124, CH126-CH127); ▪ Archaeological monitoring at the Bonniconlon Reservoir Site; and, ▪ Part time monitoring along existing roads.
Section 17.7.1 Construction Phase	Written notification will be given to the Minister (or relevant department) at least 2 months in advance of any works being undertaken in the vicinity of the five recorded monuments (CH011, CH021, CH026-027, CH035). The monitoring will be undertaken by a suitably qualified archaeologist working under licence as issued by the minister (DHLGH) under section 26 of the National Monuments Acts (1994-2014). In the event of archaeological features, finds and/or deposits been encountered during the course of the monitoring, the relevant authorities should be notified immediately. Preservation by record (through archaeological excavation) will only occur if it is established that preservation in situ cannot be achieved and such excavations are agreed with National Monuments Service.

Feature-specific mitigation as presented in Chapter 17 – Cultural Heritage is provided in Table 21-27, (Wherrew RWI&PS), Table 21-28 (Lisglennon), Table 21-29 (Lisglennon WTP, solar area), Table 21-30 (Lisglennon RWS&PS), Table 21-31 (Bonniconlon BPS), Table 21-32 (Bonniconlon Reservoir), Table 21-33 (Pipeline A), Table 21-34 (Pipeline B), Table 21-35 (Pipeline EC), Table 21-36 (Pipeline D) and Table 21-37 (Pipeline E).

Table 21-27 — Mitigation Measures on Cultural Heritage Resource Wherrew RWI&PS

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation measures
Wherrew	CH001 MA038-017 Enclosure	No predicted effect (neutral)	No Change	None required
Wherrew	CH002 MA038-017001 Enclosure	No predicted effect (neutral)	No Change	None required
Wherrew	CH003 MA039-003 Castle/Motte	No predicted effect (neutral)	No Change	None required
Wherrew	CH084 Townland boundary	Direct	Slight	Archaeological monitoring during construction

Table 21-28 — Mitigation Measures on Cultural Heritage Resource Lisglennon

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Lisglennon	CH004 MA022-060 Ringfort	No predicted effect (neutral)	No Change	None required
Lisglennon	CH044 NIAH 31302206 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon	CH045 NIAH 31302205 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon	CH046 NIAH 31302204 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon	CH047 NIAH 31302207 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon	CH048 NIAH 31302208 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon	CH085 Townland boundary	Direct	Slight	Archaeological monitoring during construction

Table 21-29 — Mitigation Measures on Cultural Heritage Resource Lisglennon Solar

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Lisglennon Solar	CH004 MA022-032	No predicted effect (neutral)	No Change	None required

	Ringfort			
Lisglennon Solar	CH044 NIAH 31302206 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon Solar	CH045 NIAH 31302205 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon Solar	CH046 NIAH 31302204 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon Solar	CH047 NIAH 31302207 Structure	No predicted effect (neutral)	No Change	None required
Lisglennon Solar	CH048 NIAH 31302208 Structure	No predicted effect (neutral)	No Change	None required

Table 21-30 — Mitigation Measures on Cultural Heritage Resource Lisglennon PS

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation measures
Lisglennon PS	CH005 MA022-060 Castle	No predicted effect (neutral)	No Change	None required

Table 21-31 — Mitigation Measures on Cultural Heritage Resource Bonniconlon BPS

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Bonniconlon BPS	CH033 MA031-057 Holy Well	No predicted effect (neutral)	No Change	None required
Bonniconlon BPS	CH032 MA031-056 Megalithic tomb	No predicted effect (neutral)	No Change	None required

Table 21-32 — Mitigation Measures on Cultural Heritage Resource Bonniconlon Reservoir

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Bonniconlon Reservoir	CH060 Structure	No predicted effect (neutral)	No Change	None required
Bonniconlon Reservoir	CH061 Lime kiln	No predicted effect (neutral)	No Change	None required

Table 21-33 — Mitigation Measures on Cultural Heritage Resource, Pipeline A

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Pipeline Route	CH054 Structure	Direct	Medium	Pre-construction recording of the existing structure. Archaeological monitoring during construction

Table 21-34 — Mitigation Measures on Cultural Heritage Resource, Pipeline B

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Pipeline Route	CH086 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH005 MA022-060 Castle	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH006 MA022-093 Mound	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH007 MA022-092 Holy Well	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH008 MA022-061 Crannog	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH055	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH127 Ditch	Direct	Medium	Archaeological resolution prior to construction
Pipeline Route	CH009 MA022-063 Ringfort	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH087 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH088 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH121 Possible culvert	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH122 Culvert	No predicted effect	No change	None required
Pipeline Route	CH123 Possible culvert	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH089 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH090 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH091 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH092 Townland boundary	Direct	Slight	Archaeological monitoring during construction

Pipeline Route	CH112 Bridge	No predicted effect	No Change	None required
Pipeline Route	CH113 Possible culvert	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH114 Culvert	No predicted effect	No change	None required
Pipeline Route	CH049 Structure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH093 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH010 MA030-011 Ringfort	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH011 Enclosure MA031-010	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH064 Stone culvert	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH056 Railway Track	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH012 MA030-095 Fulacht Fía	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH013 MA030-096 Fulacht Fía	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH014 RMP 030-104 Excavation	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH015 RMP030-036 Ringfort	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH057 Cut stone gatepost	No predicted effect (neutral)	Slight	If necessary, the gatepost to be removed in advance of construction, stored and re-erected.
Pipeline Route	CH058 Sign	No predicted effect (neutral)	Slight	Construction team made aware of location Archaeological monitoring during construction

Pipeline Route	CH094 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH095 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH096 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH016 NIAH 31303019 RPS No. 7 Monumental Structure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH043 NIAH 31303017 RPS No. 2 Country House	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH050 NIAH 31303018 Stables	No predicted effect (neutral)	No Change	Archaeological monitoring during construction
Pipeline Route	CH051 NIAH 31303025 RPS No. 1 Boat	No predicted effect (neutral)	No Change	None required

Table 21-35 — Mitigation Measures on Cultural Heritage Resource Pipeline C

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Pipeline Route	CH097 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH098 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH017 MA030-038 enclosure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH018 MA030-039 Enclosure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH099 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH100 Townland boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH101 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH019 MA030-041 Enclosure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH020 MA030-041001	No predicted effect (neutral)	No Change	None required

	Souterrain			
Pipeline Route	CH125 Possible Culvert	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH021 MA030-042 Earthwork	No predicted effect (neutral)	Slight	Archaeological monitoring during construction
Pipeline Route	CH022 MA030057 Ringfort	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH023 MA030-106 Fulacht Fia	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH024 MA030-044 Standing Stone	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH025 MA030-062 Ringfort	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH052 NIAH 31303025 School	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH026 MA031-050 Ringfort	No predicted effect (neutral)	Medium	Archaeological monitoring during construction
Pipeline Route	CH027 MA031-050001 Souterrain	No predicted effect (neutral)	Medium	Archaeological monitoring during construction
Pipeline Route	CH102 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH103 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH104 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH028 MA031-054001 Ringfort	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH029 MA031-054002 Building	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH126 Culvert	Direct	Medium	Archaeological monitoring during construction
Pipeline Route	CH032 MA031-056 Megalithic Tomb	No predicted effect (neutral)	No Change	None required

Pipeline Route	CH059 Roadside Shrine	No predicted effect (neutral)	No Change	Construction team made aware of location
Pipeline Route	CH030 MA031-069 Barrow	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH031 MA031-068 Barrow	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH116 Bridge	No predicted effect (neutral)	No Change	None required

Table 21-36 — Mitigation Measures on Cultural Heritage Resource Pipeline D

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Pipeline Route	CH033 MA031-057 Holy Well	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH118 Bridge	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH034 MA031-070 Standing stone	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH035 MA031-059 Ringfort	No predicted effect (neutral)	Medium	Archaeological monitoring during construction
Pipeline Route	CH036 MA031-058 Enclosure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH053 Church	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH105 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH037 MA031-061 Enclosure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH038 MA031-072 Mound	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH039 MA031-063 Standing Stone	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH040 MA031-063001 Mound	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH106 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH120 Culvert	No predicted effect (neutral)	No Change	None required

Pipeline Route	CH107 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH062 Bridge	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH063 Road	Direct	Slight	Archaeological monitoring during construction

Table 21-37 — Mitigation Measures on Cultural Heritage Resource Pipeline E

Area	Reference & Type	Impact Type	Significance of Effect	Mitigation Measures
Pipeline Route	CH124 Culvert	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH108 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH109 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH115 Culvert	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH117 Culvert	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH119 Culvert	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH110 Townland Boundary	Direct	Slight	Archaeological monitoring during construction
Pipeline Route	CH041 SL030-001 Enclosure	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH042 SL030-002 Crannog	No predicted effect (neutral)	No Change	None required
Pipeline Route	CH111 Townland Boundary	Direct	Slight	Archaeological monitoring during construction

21.14 Chapter 18 – Landscape and visual impact assessment

Mitigation and monitoring measures identified in Chapter 18 – Landscape and Visual Impact Assessment are presented in Table 21-38.

Table 21-38 — Mitigation and monitoring measures – Landscape and Visual Assessment Population and Human Health

Section Reference	Description
Section 18.8 Mitigation measures	Landscape planting to all above ground sites has been included within the project design (Refer to Chapter 3: Project Description). Landscaping measures were designed to maximise potential re-use of excavated material where possible (see Chapter 3 – Section 3.6 and RWMP submitted with the EIAR) and support biodiversity enhancement measures (see Chapter 7 – Biodiversity).
Section 18.8 Mitigation measures	Landscape planting species proposed for screening of the Proposed Development shall be selected having regard to the local climate, degree of exposure, soil characteristics and drainage conditions at each individual site. Species shall be appropriate to the specific growing conditions to promote successful establishment and the long-term effectiveness of the proposed screening.
Section 18.8 Mitigation measures	Vegetation removed to facilitate the underground pipeline and temporary site compounds will be reinstated following completion of the Proposed Development.
Section 18.8 Mitigation measures	Finishes & Materials: Built structures will utilise neutral, finishes and colours appropriate to their specific rural or upland contexts.
Section 18.8 Mitigation measures	Solar Photovoltaic (PV) Panels will consist of modern, high-efficiency modules featuring Anti-Reflective Coating (ARC) and textured glass. These specifications ensure that the panels function as dark recessive elements. A Glint and Glare Assessment was undertaken and is provided in Appendix 18-2.
Section 18.8 Mitigation measures	Site-Specific Measures (Windy Gap): Above-ground kiosks at the Windy Gap Break Pressure Tank site will be finished in black (RAL 9005 or similar) to recede against the dark tones of the upland peat and vegetation. Fencing at this location will utilise high-transparency fencing to maintain the open character of the site.
Section 18.8 Mitigation measures	The proposed landscape planting to the project will include an initial 3-year post completion establishment maintenance period. The success of planting establishment and landscape management on the site will be checked and reviewed on a regular basis to ensure successful long-term establishment. A detailed Landscape Management Plan (LMP) will be prepared prior to the commencement of construction. This plan will define the specific maintenance operations, replacement protocols for failed planting, and long-term management goals required to achieve the screening and biodiversity benefits.
Section 18.11 Monitoring Requirements	The proposed landscape planting to the project will include an initial 3-year post completion establishment maintenance period. The success of planting establishment and landscape management on the site will be checked and reviewed on a regular basis to ensure successful long-term establishment. A Landscape Management Plan (LMP) will be implemented for a minimum period of three years following completion of the works. Monitoring will include annual inspections of planting establishment, replacement of failed planting, and management of boundary vegetation to ensure the effectiveness of visual screening and landscape integration.

21.15 Chapter 19 – Risk of Major Accidents and Disasters

Mitigation and monitoring measures identified in Chapter 19 – Risk of Major Accidents and Disasters are presented in Table 21-39.

Table 21-39 — Mitigation and monitoring measures – Risk of Major Accidents and Disasters

Section Reference	Description
Section 19.7 Mitigation measures	The Proposed Development has been designed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design and in accordance with planning and legislative requirements. As no likely significant effects were identified, no additional mitigation measures are proposed.

21.16 References

Environmental Protection Agency (EPA) (2013) Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites'

Environmental Protection Agency (EPA) (2021) Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects.

Environmental Protection Agency (EPA) (2014) 'Green Procurement: Guidance for the Public Sector'. Environmental Protection Agency.

Environmental Protection Agency (2026) Position Paper Regulation 27 Consultation to inform development of Draft Guidelines for Brownfield soil and stone by-product material incorporating a PFAS screen.

Environmental Protection Agency (EPA) (2023) Explanatory Note on National By-Product Criteria For Site Win Asphalt By-Product BP-N001/2023 Ver. 1.0.

Environmental Protection Agency (EPA) (2018) 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'. Environmental Protection Agency.

Environmental Protection Agency (EPA) (2023) National By-product Criteria for Site-Won Asphalt BP-N001/2023.

Environmental Protection Agency (EPA) (2024) National By-product Criteria Greenfield Soil and Stone BP-N002/2024.

Environmental Protection Agency (EPA) (2019) Guidance on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011

Environment Agency UK (UK EA) (2025).ISO 1996-1:2016 Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures. UK Environment Agency Guidance 'Land contamination risk management (LCRM)'

CIRIA C741 Environmental Good Practice on Site, alongside other relevant measures taken from CIRIA C532, C648 and C753 which outline good practice and pollution control measures during construction.

Uisce Éireann (2021). Complaints procedure.

Uisce Éireann (2021). Uisce Éireann Sustainability Strategy 2021–2030.; Doc Ref: UE-SS-2021.

Uisce Éireann (2019), Uisce Éireann Waste Management Policy; Doc Ref: UE-WM-POL.

VDI 2119 Blatt (1996). 1996-09 Determination of the Dust precipitation with collecting pots made of glass (Bergerhoff Method) or plastic.

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