

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1) Construction Environmental Management Plan

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Acronyms and Abbreviations

Acronym	Meaning
BPS	Booster Pumping Station
BPT	Break Pressure Tank
CAR	Corrective Action Report
CEMP	Construction Environmental Management Plan
EIAR	Environmental Impact Assessment Report
EMS	Environmental Management System
EPA	Environmental Protection Agency
ESBN	Electricity Supply Board Network
EU	European Union
FCV	Flow Control Valve
IFI	Inland Fisheries Ireland
LLO	Land Liaison Officer
MI	Megalitres
Mld	Megalitres per day
NIS	Natura Impact Statement
NRA	National Roads Authority
OPW	Office of Public Works
REAC	Register of Environmental Actions and Commitments
RWI&PS	Raw Water Intake and Pumping Station
RWRM	Raw Water Rising Main
SWMP	Surface Water Management Plan
TII	Transport Infrastructure Ireland
TPR	Termination Point Reservoir
WTP	Water Treatment Plant

1. Introduction

1.1 Purpose and Scope of the Construction Environmental Management Plan

1. The purpose of this Construction Environmental Management Plan (CEMP) is to provide a framework that outlines how the Contractor working for Uisce Éireann will manage and minimise potential negative environmental effects during the Construction and Commissioning Phases of the Water Supply Project Eastern and Midlands Region (the Proposed Project). The Construction and Commissioning Phases will include all site preparation, enabling works, demolition, material delivery and storage, waste storage and removal, construction activities, route-wide testing and commissioning of the pipeline and permanent infrastructure sites, mitigation, and reinstatement.
2. This CEMP identifies the minimum requirements with regard to the appropriate mitigation, monitoring, inspection and reporting mechanisms that need to be implemented throughout construction. Compliance with this CEMP does not absolve the Contractor or sub-contractors from compliance with all relevant legislation and byelaws relating to their activities.
3. This CEMP has been produced as an appendix to the Environmental Impact Assessment Report (EIAR) which accompanies the application for development consent submitted to An Coimisiún Pleanála seeking consent for the Proposed Project.
4. Uisce Éireann will develop the detailed project design and associated tender documentation, evaluate Contractors, act as the Employers Representative and oversee the Construction Delivery Partners during the construction and commissioning of the Proposed Project. For the purposes of this CEMP, the Construction Delivery Partners are referred to as the Contractor recognising that multiple tiers of contractor may be appointed to deliver a given works package, and that multiple main design-build contracts are anticipated to deliver different elements of the Proposed Project. Following appointment, the Contractor will be required to develop more specific construction and commissioning method statements and will update the CEMP as required to reflect the detailed design and construction approaches. Each contractor will prepare a specific, targeted CEMP for their own section of the pipeline/works that complies with, as a minimum, the measures set out in this CEMP that has been submitted with the planning application.
5. This CEMP provides a framework to:
 - Describe the programme for environmental management during construction
 - Implement those monitoring and mitigation measures identified in the EIAR
 - Establish the principles and minimum standards required of the Contractor during the development of the CEMP (and associated Method Statements) prior to and throughout construction
 - Identify the relevant roles and responsibilities for developing, implementing, maintaining and monitoring environmental management activities
 - Explain the procedures for the communication of and reporting on environmental aspects of the proposed development throughout the Construction Phase.
6. It is intended that this CEMP will be a 'live' document, subject to further minor amendment to take into account the requirements of conditions attached to statutory consents, or ground or weather conditions. This may include the revision and addition of content throughout the pre-commencement phase, and into the enabling works, Construction Phase and final commissioning of the Proposed Project. It will be expanded and updated prior to the commencement of any construction activities on site, including incorporating the requirements of conditions attached to statutory consents. Any updates or changes will not be permitted to reduce the level of environmental protection or mitigation as set out in this version of

the CEMP and therefore, cannot result in a change in the predicted likely significant environmental effects of the Proposed Project.

7. The EIAR describes a range of construction approaches. This CEMP reflects the approaches to construction and commissioning described in the EIAR Chapter 5 (Construction & Commissioning) and the measures to avoid, reduce, mitigate and offset the adverse environmental effects described in the EIAR.
8. This CEMP should be read in conjunction with the following documents which have been included as part of the planning application submitted to An Coimisiún Pleanála:
 - EIAR Chapter 5: Construction & Commissioning
 - EIAR Appendix A5.2: Commissioning Strategy
 - EIAR Appendix A5.3: Methods of Working in Peat
 - EIAR Appendix A5.4: Schedule of Crossings.

1.2 Structure of the CEMP

9. The CEMP is structured as follows:
 - Section 1 introduces the Proposed Project and outlines the purpose of the CEMP
 - Section 2 describes the Proposed Project
 - Section 3 sets out the framework and mechanisms by which environmental requirements will be managed
 - Section 4 outlines the environmental management procedures to be employed during the enabling works, construction and commissioning phases
 - Sections 5 and 6 describe the measures to be implemented to avoid or reduce the likely significant negative effects identified in the EIAR during the construction of the Proposed Project.
10. This CEMP includes the following specific management plans, which will be developed by the Contractor prior to construction:
 - Surface Water Management Plan (SWMP) – Annex A
 - Soils Management Plan – Annex B
 - Waste and By-Product Management Plan – Annex C
 - Noise and Vibration Management Plan – Annex D
 - Dust Management Plan – Annex E
 - Traffic Management Plan – Appendix A7.2 of the Traffic & Transport chapter
 - Invasive Species Management Plan – Annex F.
11. A register of environmental actions and commitments (REAC) is included at Annex G. The REAC identifies specific mitigation measures and commitments included within the EIAR, Natura Impact Statement (NIS) and Water Status Impact Assessment Report to address the environmental effects of the Proposed Project.
12. Operational mitigation, habitat enhancement and landscape reinstatement proposals included in the REAC are presented on a route-wide Environmental Masterplan (EIAR Figures 4.106 to 4.184).

1.3 Procurement and Development of the CEMP

13. As described in Section 1.1 (see Section 5.3 of EIAR Chapter 5 (Construction & Commissioning) for further details), the delivery of the construction of the Proposed Project is based on the division of the works into geographic sections, including:
 - Section of work encompassing work elements which primarily involve civil, mechanical, electrical and process engineering and are sited close together (Raw Water Intake & Pumping Station (RWI&PS), Raw Water Rising Mains (RWRMs) and Water Treatment Plant (WTP))
 - Further sections based on grouping elements which are primarily pipeline/reservoir technology, accompanied by geographic partitioning of long linear works (BPT, BPS, and TPR and sections of Treated Water Pipeline between these sites)
 - There may be additional packages of work required including, for example works on the Proposed 38 kV Uprate Works; power connections to Line Valves and the BPS; and commissioning the pipeline.
14. A single Contractor will be nominated as the main contractor for each section of work to enable a coordinated approach to safety and environmental management. Under the contracting strategy the successful Contractor will ultimately be responsible for the detailed design of the Proposed Project, within the requirements and conditions as described in the EIAR, NIS, Water Status Impact Assessment Report and the development consent.
15. The Contractor will be required to comply with all performance requirements set out in the tender documentation, including those defined in any future development consent and conditions as may be granted by An Coimisiún Pleanála.
16. The main Contractor for each section of work will update this CEMP for each specific package of works as required. These CEMPs will package of be specific, targeted, and 'stand-alone' plans developed to support the detailed design and construction methodologies established during the next phase of the Proposed Project. The CEMPs will be provided to the relevant county councils for consultation and approval in advance of any construction works on site.
17. The CEMP will be a 'live' document. Any further amendment by the Contractor will ensure that it:
 - Is drafted in accordance with the mitigation measures specified in the EIAR, NIS, Water Status Impact Assessment Report and this CEMP
 - Complies with any conditions that may be prescribed as part of the development consent for the Proposed Project
 - Aligns with the design and construction impacts described in the EIAR, NIS and Water Status Impact Report and ensures there is no change in terms of likely significant effects on the environment
 - Identifies opportunities for further reducing or avoiding likely significant adverse effects
 - Implements good practice, having regard to relevant industry guidelines and good practice publications, as well as Uisce Éireann's corporate objectives and general regulatory requirements.
18. The CEMP will be a 'live' document to be reviewed and revised regularly as construction and commissioning progress. The process for update, review and approval of the CEMP must be documented by the Contractor in the CEMP to ensure that all revisions can be easily understood, applied and updated by Uisce Éireann and the Contractor throughout the Construction and Commissioning Phases.

19. It is expected that minor amendments to the CEMP may be necessary to reflect, among other things, changes in the project scope, contract scheduling, Contractor appointments, design development and construction methodologies, environmental management policies, practices or regulations, and developments on the site. These reviews and updates are necessary to achieve continual improvement in environmental performance and that good practice as a minimum is implemented throughout. The Contractor will need to demonstrate to Uisce Éireann that proposed amendments to the CEMP will lead to no net reduction in environmental outcomes or change in the likely significant effects described in the EIAR.
20. Once the Proposed Project is constructed and commissioned, the Contractor will be responsible for handing over the CEMP to Uisce Éireann following the end of the defects notification period. This will be achieved by incorporating the CEMP into the Safety File(s) to be handed over to Uisce Éireann.

2. Project Description

2.1 Proposed Project Overview

21. The Proposed Project would comprise an abstraction of raw water from Parteen Basin on the Lower River Shannon and various elements of water supply infrastructure, which collectively would extend from Parteen Basin in County Tipperary, through the Midlands, to Peamount in County Dublin. The Proposed Project consists of the following main features:

- Abstraction of raw water from Parteen Basin on the Lower River Shannon downstream of Lough Derg and the towns of Ballina and Killaloe
- A RWI&PS on the eastern shore of Parteen Basin would facilitate a maximum abstraction of up to 300Mld, during peak demand periods from the Lower River Shannon, downstream of Lough Derg
- Two steel pipelines, approximately 2km in length, and each 1,500mm in diameter, referred to as the RWRMs. These would transfer raw water from the RWI&PS to a WTP near Birdhill, County Tipperary and each pipe would be capable of transferring raw water up to a maximum throughput of 300Mld
- The WTP would provide the infrastructure needed to clean the water to drinking standards and the capacity to pump the water through the Treated Water Pipeline
- Approximately 170km of 1,600mm diameter single steel pipeline, comprising:
 - A Treated Water Pipeline from the WTP to a BPT near Cloughjordan, County Tipperary, approximately 37km long
 - A Treated Water Pipeline from the BPT to the TPR at Peamount, County Dublin, approximately 133km in length¹
- The TPR would have a capacity of 75MI and would provide the location for the Proposed Project to connect into the existing drinking water network
- Pipeline infrastructure including a BPT near Cloughjordan, County Tipperary; a BPS east of Birr, County Offaly; and a Flow Control Valve (FCV) south of Newtown in County Kildare, approximately 5km west of the TPR
- Operational ancillary infrastructure at frequent intervals along the length of the pipeline including Line Valves, Air Valves, water discharge points (referred to as 'Washouts'), access points (referred to as Manways), parking Lay-Bys for maintenance access and power connections to the Line Valves
- Power connections to the Infrastructure Sites² including uprating of the existing Ardnacrusha – Birdhill 38 kV overhead line to deliver adequate electrical power to the RWI&PS and WTP and a new connection from a substation at Birr to the BPS.

22. In addition to this infrastructure, provision has been made for take-off points at strategic locations between the WTP and TPR. These would facilitate future potential connections to supply communities in the Midlands within the Water Supply Area³ without disruption to the operation of the pipeline. The location of these future potential connections align with the Eastern and Midlands Plan (Irish Water 2022). The

¹ A combination of pumping and gravity would be used to transfer water through the pipeline. Water would be pumped from the RWI&PS to the WTP and from the WTP to the BPT which is the high point along the pipeline. From the BPT, the water would usually flow by gravity along the remaining 133km to the TPR. However, at times when the volume of water needed is higher than approximately 165Mld, the water would be pumped through the whole length of the pipeline. The BPS provides the capacity to do this additional pumping when it is required.

² 'Infrastructure Sites' is the collective term that has been used for the RWI&PS, WTP, BPT, BPS, FCV and TPR.

³ The Water Supply Area is an area defined by the infrastructure and transfer pipeline, where the proximity of treated water supplies from the Proposed Project offers opportunities for potential future consolidation of existing smaller and more vulnerable public water supply schemes, in a resilient, well-supported configuration. Potential future connecting infrastructure would be subject to separate consenting processes.

connecting pipelines and associated infrastructure would be delivered by Uisce Éireann through separate projects, yet to be designed, and would be subject to their own separate consenting processes.

23. A detailed project description is set out in Chapter 4 (Proposed Project Description) of the EIAR, and a detailed description of the construction and commissioning approaches for the Proposed Project is set out in Chapter 5 (Construction & Commissioning).
24. Once completed, the Proposed Project would provide the capability to meet the needs of 36 Water Resource Zones (WRZs) across the Eastern and Midlands Region. This aligns with the Regional Water Resources Plan (RWRP) Eastern and Midlands (Irish Water 2022). It would do this by securing a new source of drinking water from the River Shannon at Parteen Basin.
25. A raw water abstraction consent is being sought to cover the operational requirements of providing up to 300Mld of treated water in 2050.
26. A graphical overview of the Proposed Project, including the locations of the permanent infrastructure sites and routing of the pipeline, is shown in Image 1.1. More detailed plans of the Proposed Project design are included in Volume 5 (Drawings and Figures) of the EIAR (see Figures 4.1 to 4.105).

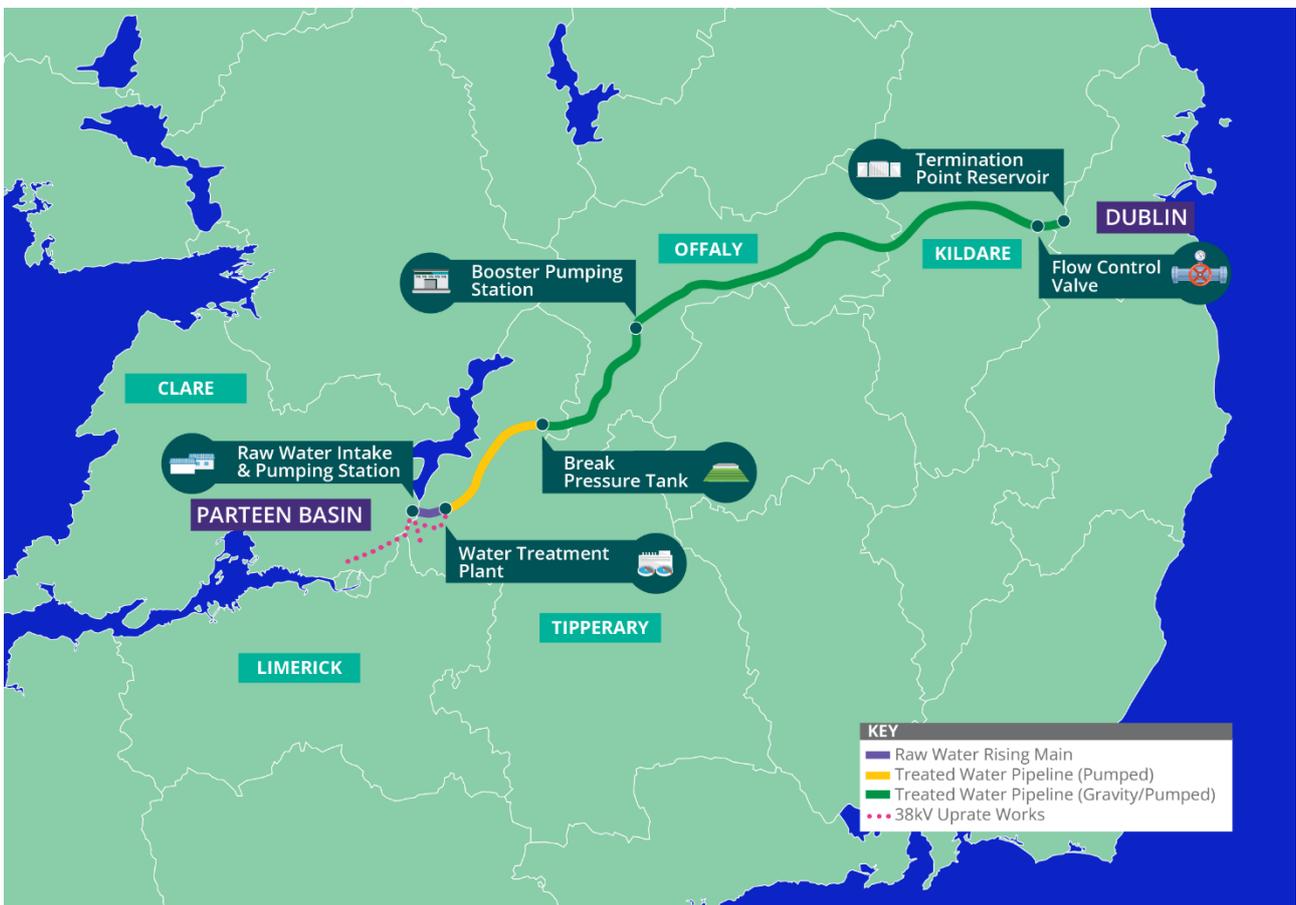


Image 1.1: Overview of the Proposed Project

27. Table 1.1 outlines a summary of the principal project infrastructure.

Table 1.1: Principal Elements of the Proposed Project

Proposed Project Infrastructure	Outline Description of Proposed Project Infrastructure*
Permanent Infrastructure	
Raw Water Intake and Pumping Station (RWI&PS) (Infrastructure Site) County Tipperary	<ul style="list-style-type: none"> • The RWI&PS would be located on a permanent site of approximately 4ha on the eastern shore of Parteen Basin in the townland of Garrynatineel, County Tipperary. In addition, approximately 1ha of land would be required on a temporary basis during construction. • The RWI&PS has been designed to abstract enough raw water from the River Shannon at Parteen Basin to provide up to 300Mld of treated water by 2050. • The RWI&PS site would include a bankside Inlet Chamber, the Raw Water Pumping Station Building, two Microfiltration Buildings, an Electricity Substation and Power Distribution Building, and Dewatering Settlement Basins. The tallest building on the RWI&PS site would be the Microfiltration Buildings which would be 10.9m above finished ground level. Additionally, there would be a telemetry mast, the top of which would be 14m above finished ground level. • Power for the RWI&PS would be supplied via an underground connection to the existing Birdhill 38 kV electricity substation. • A new permanent access road from the R494 would be constructed to access the proposed RWI&PS site. This access road would be 5m in width and 670m in length. • The RWI&PS site boundary would be fenced with a stock proof fence and a 2.4m high paladin security fence 5m inside the boundary. The site would be landscaped in line with the surrounding environment to reduce its visual impact.
Raw Water Rising Mains (RWRMs) (Pipeline) County Tipperary	<ul style="list-style-type: none"> • The RWRMs would consist of two 1,500mm underground pipelines made from steel that would carry the raw water approximately 2km from the RWI&PS to the Water Treatment Plant (WTP) at Incha Beg, County Tipperary. The water would be pumped from the pumping station at the RWI&PS to the WTP. • Twin RWRMs have been proposed so that one RWRM can be taken out of service for cleaning and maintenance while still providing an uninterrupted flow of raw water through the other RWRM. • The RWRMs would include Line Valves, a Lay-By, Air Valves and Cathodic Protection. • A 20m wide Permanent Wayleave would provide Uisce Éireann with operational access to the RWRMs.
Water Treatment Plant (WTP) (Infrastructure Site) County Tipperary	<ul style="list-style-type: none"> • The WTP would be located on a permanent site of approximately 31ha at Incha Beg, County Tipperary, 2.6km north-east of the village of Birdhill, and 2km east of the proposed RWI&PS. In addition, approximately 2.5ha of land would be required on a temporary basis during construction. • The WTP would treat the raw water received from the RWI&PS via the RWRMs. Once treated, the High Lift Pumping Station (HLPS) would deliver the treated water onwards from the WTP to the Break Pressure Tank (BPT) at Knockanacree, County Tipperary, via the Treated Water Pipeline. • The WTP would comprise of a series of tanks and buildings including the Raw Water Balancing Tanks, Water Treatment Module Buildings, Sludge Dewatering Buildings, Sludge Storage Buildings, Clear Water Storage Tanks and HLPS, an Electricity Substation and Power Distribution Building, and the Control Building. The tallest building on the WTP site would be the Water Treatment Module Buildings which would be up to 15.6m above finished ground level. Additionally, there would be a telemetry mast, the top of which would be 14m above finished ground level. • There would also be a potential future water supply connection point at the junction between the permanent access road and the R445. • Power for the WTP would be supplied via an underground connection to the existing Birdhill 38 kV electricity substation. Solar panels would be placed on the roofs of the Chemical Dosing Manifold Building, the Water Treatment Module Buildings, Clear Water Storage Tanks and Sludge Storage Buildings, and at a number of locations on the ground to supplement the mains power supply. • A new permanent access road from the R445 would be constructed and would be 6m in width and 640m in length. • The WTP site boundary would be fenced with a stock proof fence and a 2.4m high palisade security fence 5m inside the boundary. The site would be landscaped in line with the surrounding environment to reduce its visual impact.

Proposed Project Infrastructure	Outline Description of Proposed Project Infrastructure*
Treated Water Pipeline from the WTP to the BPT (Pipeline) County Tipperary	<ul style="list-style-type: none"> The Treated Water Pipeline from the WTP to the BPT would consist of a single 1,600mm underground steel pipeline which would be approximately 37km long. The water would be pumped through this section of the Treated Water Pipeline by the HLPS. The Treated Water Pipeline would include Line Valves, Washout Valves, Air Valves, Manways, Cathodic Protection and Lay-Bys. A 20m wide Permanent Wayleave would provide Uisce Éireann with operational access to the pipeline (this Wayleave has been extended to approximately 30m at some Line Valves to provide access between the Lay-Bys and Line Valves). There would be an additional 10m wide Permanent Wayleave at certain locations for operational access to smaller pipes connecting Washout Valves with permanent discharge locations.
Break Pressure Tank (BPT) (Infrastructure Site) County Tipperary	<ul style="list-style-type: none"> The BPT would be located on a permanent site of approximately 7ha in the townland of Knockanacree, County Tipperary. In addition, approximately 0.8ha of land would be required on a temporary basis during construction. The BPT would be located at the highest point of the pipeline. It marks the end of the Treated Water Pipeline from the WTP to the BPT and the start of the Treated Water Pipeline from the BPT to the Termination Point Reservoir (TPR) in the townland of Loughtown Upper, at Peamount, County Dublin. It would act as a balancing tank and would be required to manage the water pressures in the entire Treated Water Pipeline during flow changes, particularly during start-up and shut-down. The BPT site would include the BPT and a Control Building. The BPT would be a concrete tank divided into three cells covered with an earth embankment. The BPT tanks would be 5m in height and partially buried below finished ground levels. The Control Building would be 7.5m over finished ground level. Additionally, there would be a telemetry mast, the top of which would be 14m above finished ground level. Access to the BPT site would be via a new permanent access road from the L1064 which would be 5m wide and 794m in length. Power for the BPT would be supplied via an underground connection from the existing overhead power line. Solar panels would be placed on the south facing side of the control building roof, on the BPT and at ground level to the south of the site to supplement the mains power supply. The BPT site boundary would be bounded by the existing hedgerow / tree line with a 2.4m high palisade security fence around the permanent infrastructure. The site would be landscaped in line with the surrounding environment to reduce its visual impact.
Treated Water Pipeline from the BPT to the TPR (Pipeline) Counties Tipperary, Offaly, Kildare and Dublin (within the administrative area of South Dublin County Council)	<ul style="list-style-type: none"> The Treated Water Pipeline from the BPT to the TPR would consist of a single 1,600mm underground steel pipeline, approximately 133km long. The water would normally travel through the Treated Water Pipeline by gravity; however, flows greater than approximately 165Mld would require additional pumping from the Booster Pumping Station (BPS) in the townland of Coagh Upper, County Offaly. The Treated Water Pipeline would include Line Valves, Washout Valves, Air Valves, Manways, Cathodic Protection, Lay-Bys and potential future connection points. A 20m wide Permanent Wayleave would provide Uisce Éireann with operational access to the pipeline (this Wayleave has been extended to approximately 30m at some Line Valves to provide access between the Lay-Bys and Line Valves). There would be an additional 10m wide Permanent Wayleave at certain locations for operational access to smaller pipes connecting Washout Valves with permanent discharge locations.
Booster Pumping Station (BPS) (Infrastructure Site) County Offaly	<ul style="list-style-type: none"> The BPS would be located on a permanent site of approximately 2.6ha in the townland of Coagh Upper, County Offaly. It would be located approximately 30km downstream from the BPT. In addition, approximately 3ha of land would be required on a temporary basis during construction. The BPS would be required when the demand for water causes the flow through the pipeline to exceed approximately 165Mld. The BPS site would consist of a single-storey Control Building with a basement below. It would have a finished height of 7.6m above finished ground level. There would also be a separate Electricity Substation and Power Distribution Building. Additionally, there would be a telemetry mast, the top of which would be 14m above finished ground level. Power to the BPS would be supplied from an existing 38 kV electricity substation at Birr, through cable ducting laid within the public road network. There would be ground mounted solar panels on the southern side of the BPS site to supplement the mains power supply. The site would be accessed directly from the L3003. The BPS site boundary would be fenced with a stock proof fence and a 2.4m high palisade security fence between 5m -12m inside the boundary. The site itself would be landscaped in line with the surrounding environment to reduce its visual impact.

Proposed Project Infrastructure	Outline Description of Proposed Project Infrastructure*
<p>Flow Control Valve (FCV) (Infrastructure Site) County Kildare</p>	<ul style="list-style-type: none"> The FCV controls the flows in the Treated Water Pipeline from the BPT to the TPR. It would be a small permanent site of approximately 0.5ha in the townland of Commons Upper in County Kildare. In addition, approximately 0.6ha of land would be required on a temporary basis during construction. It would consist of three 700mm diameter FCVs and three flow meters installed in parallel with the Line Valve and housed within an underground chamber. Access to the FCV site would be directly off the L1016 Commons Road Upper. Power supply to the FCV site would be provided from the existing low voltage network via a combination of overhead lines and buried cables. There would be ground mounted solar panels on the north-eastern side of the site to supplement the mains power supply. Kiosks at the FCV site would house the Programmable Logic Controller, telemetry and power supply for the Line Valve. There would also be a telemetry mast, the top of which would be 14m above finished ground level. The site boundary would be fenced with a stock proof fence and a 2.4m high palisade security fence 5m inside the boundary.
<p>Termination Point Reservoir (TPR) (Infrastructure Site) County Dublin (within the administrative area of South Dublin County Council)</p>	<ul style="list-style-type: none"> The TPR would be located on a permanent site of approximately 8.3ha adjacent to an existing treated water reservoir in the townland of Loughtown Upper, at Peamount, County Dublin (within the administrative area of South Dublin County Council) and would have capacity for 75ML of treated water supply. In addition, approximately 1.1ha of land would be required on a temporary basis during construction. It would be located at the downstream end of the Treated Water Pipeline from the BPT to the TPR and would be the termination point for the Proposed Project. It would be at this location that the Proposed Project would connect to the existing water supply network of the Greater Dublin Area Water Resource Zone (GDA WRZ). The TPR would consist of an above-ground storage structure, associated underground Scour Water and Overflow Water tanks and a Chlorine Dosing Control Building. The TPR would be a concrete tank divided into three cells and covered with an earth embankment. The top of the TPR would be 11.2m above finished ground level. The Chlorine Dosing Control Building would be 8.4m over finished ground level. Additionally, there would be a telemetry mast, the top of which would be 14m above finished ground level. Power for the TPR would be supplied via an underground connection to the existing electricity substation at Peamount Reservoir. There would be solar panels on top of a portion of the northern cell of the TPR to supplement the mains power supply. A new permanent access road from the R120 would be constructed and would be 5m wide and 342m in length. The TPR site would be bounded by the existing hedgerow to the west and existing fence to the east with a 2.4m high palisade security fence around the permanent infrastructure. The site itself would be landscaped in line with the surrounding environment to reduce its visual impact.
Proposed 38 kV Uprate Works – Power Supply to RWI&PS and WTP	
<p>Proposed 38 kV Uprate Works Ardnacrusha – Birdhill (Power Supply) Counties Clare, Limerick and Tipperary</p>	<ul style="list-style-type: none"> The proposed 38 kV Uprate Works would be necessary to deliver adequate electrical power to the RWI&PS and WTP. The proposed works would include the uprating of the existing Ardnacrusha – Birdhill Line and the replacement of polesets/structures with an underground cable along a section of the Ardnacrusha – Birdhill – Nenagh Line. There would also be works at the existing Birdhill 38 kV electricity substation including the provision of a new 38 kV modular Gas Insulated Switchgear Modular Building, new electrical equipment and lighting, together with new fencing and associated works.
Temporary Infrastructure – Required for Construction Phase Only	
<p>Construction Working Width Counties Tipperary, Offaly, Kildare and Dublin (within the administrative area of South Dublin County Council)</p>	<ul style="list-style-type: none"> A Construction Working Width would be temporarily required for the construction of the RWRMs and the Treated Water Pipeline, and the subsequent reinstatement of the land. The Construction Working Width would generally be 50m in width but would be locally wider near features such as crossings, access and egress points from the public road network, Construction Compounds and Pipe Storage Depots.

Proposed Project Infrastructure	Outline Description of Proposed Project Infrastructure*
<p>Construction Compounds Counties Tipperary, Offaly, Kildare and Dublin (within the administrative area of South Dublin County Council)</p>	<ul style="list-style-type: none"> • Eight Construction Compounds would be temporarily required to facilitate the works to construct the Proposed Project. Five Construction Compounds would be located along the route of the Treated Water Pipeline at the following Infrastructure Sites: RWI&PS, WTP, BPT, BPS and TPR, with an additional three Construction Compounds located at Lisgarriff (County Tipperary), Killananny (County Offaly) and Drummond (County Kildare). Construction Compounds would act as a hub for managing the works including plant/material/worker movement, general storage, administration and logistical support. • The Principal Construction Compound at the WTP would require 30ha of land during construction. • The other three Principal Construction Compounds would require land temporarily during construction ranging between approximately 12ha and 16ha. • The four Satellite Construction Compounds at the other permanent Infrastructure Sites (excluding the FCV) would require land during construction ranging between approximately 3ha and 12ha.
<p>Pipe Storage Depots Counties Tipperary, Offaly and Kildare</p>	<ul style="list-style-type: none"> • Nine Pipe Storage Depots would be temporarily required to supplement the Construction Compounds and would serve the installation of pipe between the WTP and the TPR. • Pipe Storage Depots would take direct delivery of the pipe for storage before onward journey to the required location along the Construction Working Width. • The Pipe Storage Depots would vary in size and require land temporarily during construction generally ranging between approximately 2ha and 7ha but with one site being larger at 11ha.

* Note all land take numbers in this table are affected by rounding to one decimal place.

2.2 Construction Phasing

28. Construction works are currently anticipated to commence in 2028, subject to planning approval from An Coimisiún Pleanála. The construction works are anticipated to last for approximately five years. The construction and commissioning activities for the principal elements of the Proposed Project would encompass the following broad areas of work:

- Pre-construction surveys including for example, biodiversity surveys for species checks and ground investigation
- Establishment of Construction Compounds including parking areas, storage areas, power supply and welfare facilities
- Establishment of Pipe Storage Depots
- Erection of temporary fencing
- Site clearance, including removal of topsoil, trees and hedgerows as required
- Construction of site roads and temporary access roads
- Construction of Infrastructure Sites
- Construction of pipelines – RWRMs and the Treated Water Pipeline
- Construction of pipeline features including Line Valves, Washout Valves, Air Valves, Lay-Bys, FCV and Potential Future Connection Points
- Ancillary works including system control infrastructure, lighting, fencing, kiosks, power supplies and Cathodic Protection
- Site landscaping and planting
- Testing and commissioning
- Site demobilisation
- Handover to the appointed Operator.

29. A detailed programme and schedule of works will be developed prior to the commencement of work on-site by the Contractor. Over the estimated five-year Construction Phase of the Proposed Project, the construction activities would be sequentially scheduled by the appointed Contractor to optimise resources and programme.
30. The 38 kV Uprate Works would be carried out by dedicated ESNB crews and/or appointed Contractors working on behalf of ESNB and would be scheduled sequentially to optimise ESNB resources. Based on ESNB's experience of previous similar works on 38 kV infrastructure, it is anticipated that the proposed uprate works would take up to 12 months to construct. It is anticipated that, subject to planning approval from An Coimisiún Pleanála, the Proposed 38 kV Uprate Works would commence in 2029.

2.2.1 Construction Programme

31. The indicative duration and phasing of the principal elements of the Proposed Project are shown in Image 1.2 (refer to EIAR Chapter 5 (Construction & Commissioning) for more detailed construction programme information and descriptions).

Environmental Impact Assessment Report (EIAR) Volume 6 of 6: Appendices (Appendix A5.1) Construction Environmental Management Plan

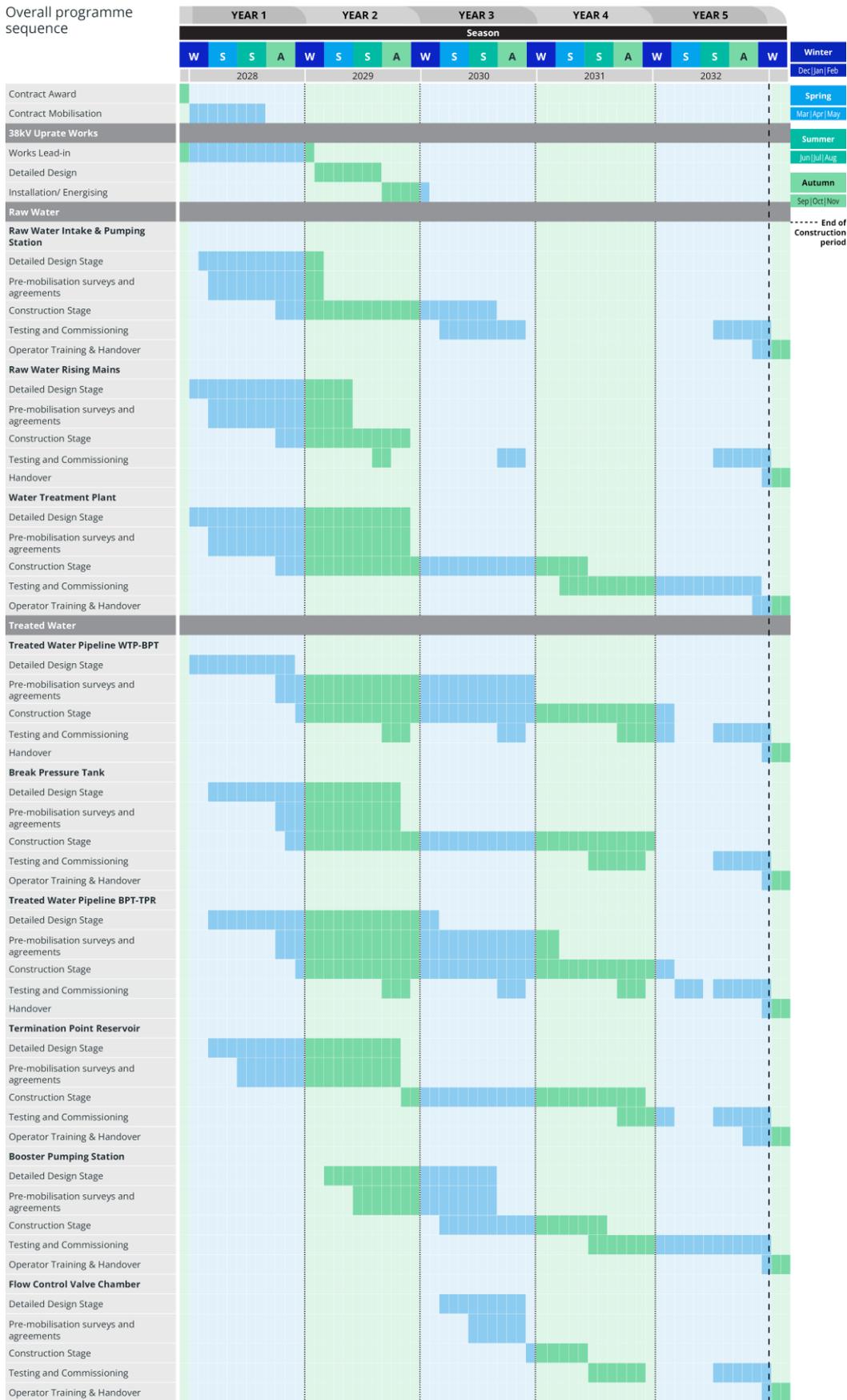


Image 1.2: Indicative Duration and Phasing of the Principal Elements of the Proposed Project

3. Environmental Management Framework

3.1 Overview

32. The contract(s) awarded for the Proposed Project will include a requirement for the Contractor to comply with relevant documentation, including the EIAR, planning (and other statutory consent) conditions received, this CEMP and any subsequent amendments to the CEMP.
33. As part of the environmental management framework, the Contractor will comply with all relevant environmental legislation and take account of published standards, accepted industry practice, national guidelines and codes of practice appropriate to the Proposed Project. Due regard will be given to the guidance and advice provided by the ISO 14001 Environmental Management Systems Standard (2015) and other relevant publications listed in this CEMP.
34. The Contractor will be required to develop and implement an Environmental Management System (EMS) that follows the principles of ISO 14001. Furthermore, the Contractor's EMS will include an environmental policy, operational, monitoring and auditing procedures to ensure compliance with all environmental requirements and to monitor compliance with environmental legislation and the environmental management provisions outlined in the relevant documentation.

3.2 Responsibilities

3.2.1 Employer

35. Uisce Éireann will be the employer responsible for ensuring that competent parties are appointed to undertake construction and that sufficient resources are available to enable the requirements of this CEMP to be met.

3.2.2 Employer's Representative

36. Uisce Éireann and/or the Employer Representative appointed by Uisce Éireann will be responsible for implementing the CEMP and monitoring compliance. The Employer Representative will be required to appoint temporary or permanent specialists with appropriate skills and experience as required to implement on-site procedures and monitor construction on behalf of Uisce Éireann.

3.2.3 The Contractor

37. Uisce Éireann currently intends to procure the detailed design and construction of the Proposed Project using Design-Build contracts that will be divided up by geographical section and by type of works. Under this form of contract the Contractor will ultimately be responsible for the detailed design of the Proposed Project and will be contractually required to develop and implement the CEMP for each specific package of works, as outlined in Section 1.3.
38. The Contractor will be contractually responsible for the organisation, direction and execution of environment-related activities during the detailed design and construction of the Proposed Project. The Contractor is required to undertake all activities in accordance with the relevant environmental requirements including the consent documentation and other regulatory and contractual requirements.

3.2.4 Construction Manager

39. Construction Manager(s) will be appointed by the Contractor to oversee the day-to-day management of working areas within each site and ensure that effective, safe, planned construction activities are delivered on an ongoing basis. The Construction Manager(s) will be a suitably qualified, competent and experienced professional(s) who will oversee site logistics, communicate regularly with construction staff, accommodate project-specific inductions for staff on site and ensure that all work is compliant with the relevant design standards and health and safety legislation. The Construction Manager(s) will be familiar with the environmental commitments and requirements contained in the CEMP and will work with the Environment Manager as required to implement measures set out in the CEMP.

3.2.5 Environmental Manager

40. An Environmental Manager will be appointed by the Contractor to ensure that the CEMP is fully adopted, effectively implemented and amended and updated as required. The Environmental Manager will be a suitably qualified, competent and experienced professional who will perform the necessary tasks, review environmental procedures and consult with members of the construction team and external stakeholders as required. The Environmental Manager will be responsible for:

- Compliance with relevant environmental legislation
- Preparing, maintaining and implementing the CEMP
- Establishing, implementing, and maintaining the EMS having regard to the requirements of ISO 14001:2015 (or the most current version available)
- Delivering continual improvement in environmental performance
- Conducting regular environmental inspections and audits as specified in the contract and checking adherence to the CEMP
- Ensuring that construction occurs in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented
- Completing a site inspection and compiling an environmental compliance report on a monthly basis
- Attending site and stakeholder meetings as required
- Keeping up-to-date with relevant environmental good practice and legislative changes
- Liaising with the relevant staff to prepare Method Statements and relevant plans for all activities where there is a risk of environmental harm
- Having a detailed level of knowledge on all aspects of environmental information associated with the Proposed Project
- Ensuring all personnel have undertaken adequate environmental inductions, awareness briefings and training (including sub-contractors)
- Dealing with environment-related complaints
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner
- Interfacing with other contracts on the Proposed Project to achieve consistency of approach and share lessons learnt.

3.2.6 Environmental Specialists Engaged by the Contractor

41. To fulfil its obligations under the CEMP and to support its Environmental Manager, the Contractor will engage from time to time and as instructed by the Environmental Manager, suitably qualified and experienced personnel, including the following (depending on the scope of the contract):
- Archaeologist (in consultation with Uisce Éireann's Project Archaeologist)
 - Terrestrial Ecologist (including relevant specialists as required, such as an ornithologist)
 - Aquatic Ecologist
 - Noise and Vibration specialist
 - Air Quality and dust specialist
 - Soils and Land Quality specialist
 - Landscape Architect
 - Arboriculturist
 - Water Environment specialist.

3.3 Communication Procedures

3.3.1 External Communication with the Public and Key Stakeholders

42. Uisce Éireann and the Contractor will take all reasonable steps to engage with stakeholders in the local community, especially those who may be affected by the construction works including residents, businesses, community resources and specific vulnerable groups.
43. Uisce Éireann's Landowner Liaison Officers (LLOs) will be the landowners' principal points of contact for the construction works and will act as the interface between landowners and Uisce Éireann's construction team. They will remain in role throughout construction, reinstatement and handover stages. They will liaise with landowners and the Contractor's Environmental Manager in connection with general environment matters that may occur throughout the Construction Phase.
44. Items to be discussed and agreed with landowners in advance of any works commencing may include, but are not limited to:
- Particular access requirements for livestock and vehicles to allow suitable access to be maintained throughout the duration of the works
 - Fencing requirements, to deliver appropriate temporary fencing and gates during construction
 - Identifying the presence of any existing drainage to enable connections to be maintained or temporary solutions implemented during construction works, and to deliver appropriate permanent solutions on completion of the works
 - Identifying the locations of any private water supplies, boreholes, tracks or private access roads
 - Identifying the locations of any known services (and advising the landowner in the event unforeseen services are encountered and agreeing any control measures required)
 - Any tree pruning or tree protection required
 - Any preparatory work for the preservation of hedges, trees, buildings or features within the Construction Working Width
 - The proposed schedule for works on their land.
45. Communication protocols will be established and recorded within the CEMP and results of ongoing and future consultations will feed into the development and continued update of the CEMP.

46. The Contractor will be responsible for preparing and implementing a Stakeholder Communications Plan which will be developed under the supervision of the designated LLO (or equivalent officer) appointed by Uisce Éireann. This plan will provide a means by which members of the public have a direct point of contact within the Contractor's staff and allows for the Contractor to communicate key information on the Proposed Project at the appropriate time to the general public. Such information may include the timing, nature and duration of potentially disruptive activities, such as temporary road closures and noise-generating construction techniques.
47. LLOs will ensure that local residents, occupiers, businesses, local authorities and all other stakeholders affected by the proposed construction works, as outlined in the EIAR, will be informed in advance of work taking place. The notifications will detail the estimated duration of the works, the working hours and the nature of the works. In the case of works required in response to an emergency, the local authority, local residents and businesses will be advised. All notifications will include a local helpline number. In addition, information on the works will also be available on the Proposed Project website.
48. Uisce Éireann will establish coordination and communication meetings with key stakeholders. The Contractor will attend these meetings as required and arrange other meetings where necessary. Any plans which have been approved by Uisce Éireann will be issued to the relevant stakeholders.

3.3.2 Internal Communication

49. Site management meeting(s) and weekly site safety meetings, which will be attended by the Environmental Manager, will include environmental issues (such as monitoring, complaints, incidents) on the agenda.
50. On-site communications, such as daily shift and activity briefings, will be used to advise the site workforce of anticipated health, safety, environmental and community matters that are relevant to particular locations and during certain types of construction activity. This will include information obtained from liaising with the community. This communication will be addressed to all relevant members of the workforce, including during the induction of new starters and onboarding of sub-contractors, before they commence work. Toolbox talks will be used as a means to disseminate information to the workforce on a routine basis.

4. Environmental Management Procedures

4.1 Environmental Awareness, Training and Competence

51. The Contractor will be selected with due consideration of relevant construction environmental management qualifications and experience. The Contractor will be required to employ construction staff with appropriate skills, qualifications and experience appropriate to the needs of the works that will be carried out during construction.
52. The Contractor will establish an environmental awareness training programme and will ensure that all personnel receive adequate training prior to the commencement of construction activities. A minimum level of environmental awareness will be established through environmental induction training provided by the Environmental Manager. Key environmental considerations and objectives will be incorporated into this induction. Without such training, those involved in construction of the Proposed Project would not be aware of relevant environmental control measures and consequently, environmental commitments/requirements could not be met. Specifically, site inductions will cover the following as a minimum:
- Introduction to the Environmental Manager
 - Description of the CEMP, the role of individual employees' in delivering the requirement of the CEMP, and the consequences of non-compliance
 - The requirements of due diligence and duty of care
 - Overview of conditions of consents, permits and licences, including environmental control measures and commitments
 - Requirements associated with community engagement and stakeholder consultation
 - Identification of environmental constraints and notable features within the site
 - Procedures associated with incident notification and reporting including procedures for dealing with damage to the environment.
53. Signed records of environmental training will be established, maintained and made available on request to the Employer's Representative.

4.2 Inspections, Auditing and Monitoring Compliance

54. For the duration of the contract(s), the environmental performance of the Contractor will be monitored through site inspections and audits by the Environmental Manager. This will be overseen by a suitably qualified and experienced representative engaged by Uisce Éireann. The schedule for monitoring, inspections and audits will be specified in the contract; it is likely to be a combination of internal inspections and independent external audits that will comprise both scheduled and random inspections.
55. Records of all inspections carried out will be recorded on standard forms and all actions will be closed out in a reasonable timescale. The Contractor will update the CEMP to include further details of inspection processes and procedures.

4.2.1 Inspections

56. The Environmental Manager will carry out environmental inspections of construction activities at appropriate intervals to ensure all necessary environmental measures relevant to the construction activities are being effectively implemented.

57. Where appropriate and when required, the Environmental Manager will arrange to be accompanied on these environmental inspections by suitably qualified environmental professionals whose skills set is appropriate to the nature of the inspection. A schedule of external stakeholders who will have access to inspections reports will be set up and maintained. On request, relevant local authorities will be given access to the results of monitoring, along with the opportunity to attend site visits to verify compliance with the requirements of the CEMP.

4.2.2 Monitoring

58. Mitigation and monitoring will be carried out in accordance with the requirements of the EIAR, NIS and Water Status Impact Assessment Report so that construction activities are undertaken in a manner that does not give rise to significant negative effects. Proposed monitoring is set out for each environmental topic in the REAC (Annex G).
59. The results of all environmental monitoring activities will be reviewed by the Environmental Manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary. The Contractor will inform Uisce Éireann of any pre-determined thresholds or criteria that are exceeded.

4.2.3 Audits

60. The Environmental Manager, in conjunction with the Construction Manager, will carry out quarterly audits of the CEMP to determine whether it is effectively contributing to effective and compliant environmental performance by the Contractor. Where identified during such audits, the Environmental Manager will make all necessary changes to the plan, with the approval of the Construction Manager, and bring them to the attention of the Contractor. The CEMP will be revised, as appropriate, between these quarterly audits (for example, where environmental control measures are updated, or as new legislation or guidance is implemented).
61. Planned and documented audits aimed at evaluating the conformance of the EMS will also be carried out by the Environmental Manager. The Environmental Manager will establish a schedule for internal audits, which will be documented in the CEMP.
62. The Contractor will be required to prepare standard forms for reporting, and audit items will include but not be limited to the following activities:
- Review of environmental documentation to establish whether relevant requirements and compliance are being achieved, and continual improvement is occurring
 - Site inspection and interviews with on-site personnel
 - Reporting with recommendations.
63. For any environmental non-conformity found, the Environmental Manager will initiate and report on corrective and preventative actions required to be undertaken by the Contractor in response.

4.3 Environmental Incident Response

64. An environmental incident is an event which may cause nuisance, harm or potential harm to an environmental receptor. In response to an environmental incident, in the first instance, an investigation will be undertaken by the Environmental Manager to identify the cause and implications of the incident, and to ensure that all necessary corrective actions have been implemented and the appropriate stakeholders (both internal and external) have been informed. The Environmental Manager will produce an Environmental Incident Report noting the nature and scope of the incident, the cause and corrective actions to minimise or avoid the risk of the incident recurring. Where new or amended measures are proposed, the CEMP will be updated accordingly by the Environmental Manager.

65. The level of response to an incident will be governed by the nature and significance of the event. Incident responses may comprise:
- Corrective actions: Corrective Action Reports (CAR) will be prepared following any environmental non-conformity during environmental monitoring, inspections and/or audits on site. Such responses will be appropriate for low level events or procedural non-conformities which do not result in emergency incidents. The CAR will describe in detail the cause and effect of the non-conformity on site and describe the recommended corrective action required to remedy it, including a timeline, as well as arrangements for informing appropriate authorities and stakeholders as necessary
 - Emergency incident management: events that give rise to (or have the potential to cause) significant negative environmental effects or reputational harm such as:
 - Breach of licence obligations or environmental regulations
 - Severe pollution incidents leading to risk of prosecution
 - Forces majeures, such as flooding or wildfires arising from extreme weather events, leading to significant adverse environmental effects
 - Breaches of previously agreed environmental thresholds at specific receptors, such as local enterprises or community resources
 - See Section 5.11 for further detail on emergency response plans
 - Management of unexpected discoveries: enabling works and excavation works will be monitored to check for unexpected or unusual materials which may, for example, pose a contamination risk or in the event of encountering unexpected assets, such as archaeological remains or infrastructure assets. The Contractor will be required to develop appropriate procedures as part of their CEMP and the Environmental Manager will ensure that suitably qualified and competent personnel (such as field archaeologists or land quality specialists) are available at short notice to provide advice and guidance to the Contractor. All notable unexpected discoveries will be reported to the appropriate authorities and documented in an appropriate manner.

4.4 Reporting and Environmental Records

66. The Contractor will be required to submit a monthly environmental compliance report to Uisce Éireann for review and approval. The report will address the following as a minimum:
- Interpretation of the results of ongoing monitoring
 - Summary of compliance with the CEMP including identification of any non-conformances
 - Detailed description of any issues and/or non-conformances identified during inspections and/or audits
 - Record of incidents and corrective actions (including CARs as appropriate)
 - Summary of any environmental complaints received and/queries raised by stakeholders
 - Records of environmental training undertaken (as appropriate).
67. The Contractor will inform Uisce Éireann of all emergency incidents immediately and prepare an initial report within 24 hours setting out the details and cause (if known) of the incident. The Contractor will be required to complete an Environmental Incident Report and any further documentation requested by Uisce Éireann within seven days of the incident occurring. The report will define the scale and effects as well as required corrective actions and mitigation/remediation/compensation measures (as appropriate).

68. The Contractor will maintain appropriate environmental documentation including monitoring, test results, plans and method statements. All records will be kept up to date and be made available for audits, inspections and periodic reporting. The Contractor will maintain the following environmental records (as a minimum) that will be made available for inspection by Uisce Éireann and the relevant authorities, as required:

- Management Plans
- Environmental reports
- Records of environmental incidents
- Records of environmental training
- Corrective Action Reports
- Register of environmental complaints
- Monitoring data
- Environmental inspection and audit reports
- Waste, hazardous material and chemical inventories
- Health and safety records.

5. General Site Operations

5.1 Construction Process

69. Construction of the Proposed Project will extend from County Clare to South Dublin County and will require eight construction compound locations. The Proposed Project is a major construction project and will include many types of construction activities such as site clearance and enabling works, utility diversions, demolition of a derelict fuel station at the site of the WTP, earthworks, trenchless crossings and directional drilling, and watercourse crossings. There will be many different construction activities taking place at different locations along the route corridor. The following sections outline general construction parameters and site operations. These may differ where specific construction techniques are required to build the infrastructure differently to meet technical, safety or programme objectives at particular locations. Specific environmental mitigation measures are included in the REAC (Annex G).

5.2 Working Hours

5.2.1 Standard Working Hours

70. The timing of construction activities, standard working hours and the rate of progress of construction works often reflect a balance between construction efficiency, safe working practices, duration of daylight hours, and avoiding or minimising adverse significant effects on environmental receptors, including local communities. The Contractor's standard working hours are shown in Table 1.2, and these will be adopted across all construction areas unless there are mitigating circumstances which, by exception, require a different approach (see Section 5.2.2).

Table 1.2: Standard Working & Delivery Hours

Start	Finish	Day
07:00hrs	19:00hrs	Monday to Friday
08:00hrs	16:30hrs	Saturday

71. The Contractor will require staff and sub-contractors to adhere to these standard working hours along the construction working width and each permanent infrastructure site, unless otherwise agreed and permitted in advance with the relevant Local Authority.

5.2.2 Additional Working Hours

72. Most construction activities will be undertaken during the proposed standard working hours. However, some activities will require working outside these standard hours, for example:

- Directional drilling operations will be continuous through to completion because the technique relies on the pipe being pulled through to support the surrounding ground and preventing collapse of the bored hole
- Trenchless crossing operations may require working outside standard working hours at certain crossings
- Some open-cut crossings of roads may require round the clock operations to minimise the duration of road closures
- Occasionally, certain construction traffic will need to be moved outside typical working hours or at night. Such loads may include prefabricated tanks, large, non-standard equipment (specials), or precast concrete units. This will be done in conjunction with Gardaí, Transport Infrastructure Ireland (TII) and Local Authorities. In addition, it has been requested by Kildare County Council that construction traffic movement through Celbridge be undertaken at night to avoid impacting traffic levels during the day

- Working outside of typical working hours may also be required to carry out, or attend to, an emergency on the works.

73. If activities require work outside the hours set out in Table 1.2, not listed in Section 5.2.2, an approval will be sought from the relevant Local Authority for these on a case-by-case basis. For example, the Contractor may seek to extend the working hours for a particular activity, to take advantage of daylight hours during the summer at a location where standard working hours are scheduled.

5.2.3 Seasonal Restrictions

74. Construction of the pipeline will generally not take place during the winter months (usually December to February inclusive). In addition, land will not be handed back during this time, as the Proposed Project would still be considered to be 'in construction' until a time when it can be reinstated appropriately and sufficient time has passed for the land to recover.

75. However, preparatory works such as pre-construction surveys, the removal of sections of hedgerow for pipeline crossings, demarcation of the Construction Working Width with wayleave fencing, establishing construction access to the Construction Working Width, installing pre-construction drainage, and other advanced works such as pipeline installation by trenchless construction techniques at major crossings may take place during the winter to allow the pipelines to be constructed efficiently. Installation and fit out of valves, washouts and outfalls, power connections and the welding of pipeline could also take place during the winter period provided earthworks were not needed, during that period, to facilitate such works.

76. The main pipeline construction activities will be undertaken during the spring, summer and autumn months to take advantage of better weather and longer daylight hours. Additionally, soils are more amenable to earthworks activities and less prone to structural damage and erosion during relatively drier times of the year.

77. In-stream works will not be carried out in watercourses frequented by salmon or trout during the annual close season and will be undertaken outside of the lamprey spawning season. River and brook lamprey spawn during the period March to April, while sea lamprey spawn during the period May to August. Instream works may be carried out between October and March if juvenile lamprey are translocated; however, the salmonid spawning season will still need to be considered. The duration of the season for salmonids varies regionally. In-stream works will take place under the direction of the Ecological Clerk of Works. The timing of works will always be considered on a site-specific basis (typically works can be carried out during the period July to September) and in agreement with IFI, as some rivers have late spawning salmonids.

78. Seasonal working restrictions will apply to works where bat habitats have been identified. Breeding colonies of bats using tree roosts are very vulnerable to disturbance during the summer months when juvenile bats, that cannot yet fly, are in the roost. Bat species that hibernate in trees are also vulnerable to disturbance during the hibernation period. Therefore, all mature trees in need of removal that have been identified as having a moderate to high potential for bat roosts will be felled from late August to early November to avoid breeding populations. Felling of these trees will be avoided in winter as there is potential for bats to be in hibernation and therefore unable to escape.

79. Vegetation clearance will generally be avoided between 1 March and 31 August, to avoid impacts on nesting birds. The REAC (Annex G) details mitigation measures to be implemented where the construction programme or conflicting mitigation does not allow this seasonal restriction to be observed.

80. Further detail on seasonal restrictions with regard to ecological receptors is discussed in Chapter 8 (Biodiversity) of the EIAR, and specific seasonal constraints are set out in the REAC.

5.3 Construction Elements and Compounds

5.3.1 Classification of Site Offices and Construction Compounds

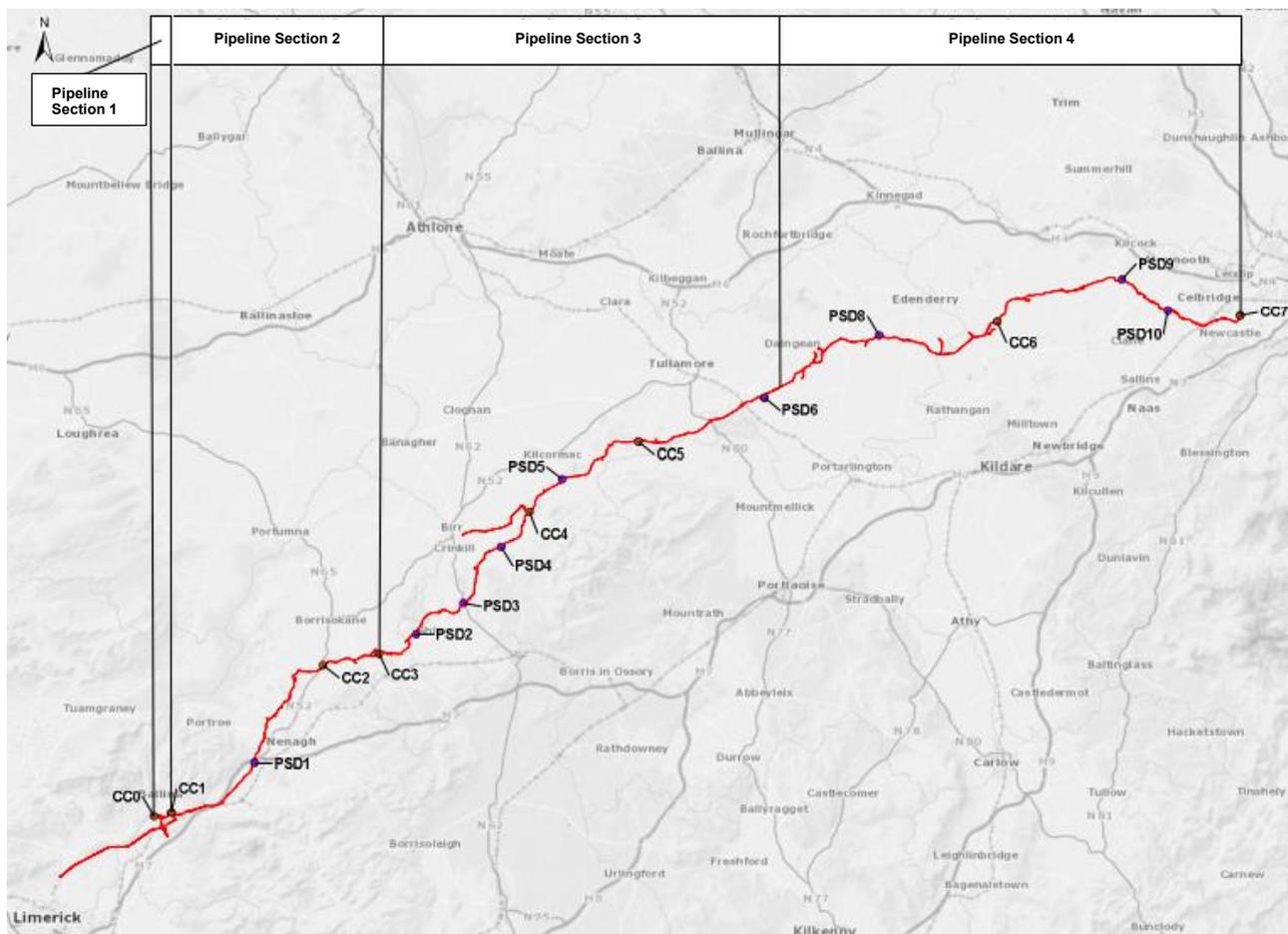
81. Construction site offices and compounds will generally be situated along, or near, those elements of the Proposed Project that they are intended to serve. Construction compounds, including any areas used for access, will be reinstated after completion of the works (apart from areas used for permanent land-take).
82. The proposed construction compounds have been classified into three categories, namely:
- Principal Construction Compounds
 - Satellite Construction Compounds
 - Pipe Storage Depots.
83. The construction and commissioning of the infrastructure associated with the Proposed Project will require four Principal Construction Compounds (one for each of the four main construction sections), four Satellite Compounds and nine Pipe Storage Depots. Details of each compound and Pipe Storage Depot and associated access arrangements can be found in EIAR Chapter 5 (Construction & Commissioning), as follows:
- Details of the four Principal and four Satellite Construction Compounds are presented in Table 5.9 of EIAR Chapter 5. Indicative layouts have been prepared for each of the proposed Principal and Satellite Construction Compounds and are shown in EIAR Figure 5.1 to Figure 5.8
 - Details of the nine Pipe Storage Depots are presented in Table 5.10 of EIAR Chapter 5. Indicative layouts have been prepared for each of the proposed Pipe Storage Depots and are shown in EIAR Figure 5.9 to Figure 5.17
 - The Construction Working Width, including Temporary Construction Roads, required for the construction of the RWRMs and Treated Water Pipeline and their subsequent reinstatement are explained in Section 5.9 of EIAR Chapter 5
 - Haul Road details are presented in Section 5.11 of EIAR Chapter 5. The Haul Roads extend across nine Local Authority areas as shown in EIAR Figures 5.18 to 5.26
 - Details of Haul Roads required for the construction of the proposed 38 kV Uprate Works are presented in Section 5.11 of EIAR Chapter 5. The proposed Haul Roads in the immediate vicinity of the 38 kV Uprate Works are indicated in EIAR Figure 5.24
 - Access/egress points to the Construction Working Width, Infrastructure Sites, Construction Compounds and Pipe Storage Depots, are shown in the Project Component Overview (EIAR Figure 4.2 to Figure 4.60) and are listed in Table 5.15 of EIAR Chapter 5.
84. Each of the construction sections would have a Principal Construction Compound, which would act as the appointed Contractor's central strategic (operational) hub for plant/material/worker movement, general storage, administration, logistical support, technical (design) staff, etc.
85. The four Principal Construction Compounds are proposed at the following locations:
- In the townland of Incha Beg, County Tipperary, within the WTP Site (EIAR Figure 4.7). This is the proposed Principal Construction Compound (CC1) for the RWI&PS, RWRMs and WTP
 - In the townland of Lisgarriff, County Tipperary (EIAR Figure 4.16). This is the proposed Principal Construction Compound (CC2) for the Treated Water Pipeline from the WTP to the BPT, the BPT itself and the section of trenchless construction to the east of the BPT
 - In the townland of Killananny, County Offaly (EIAR Figure 4.35). This is the proposed Principal Construction Compound (CC5) for the section of Treated Water Pipeline from the trenchless section east of the BPT to the BPS, and the BPS itself

- In the townland of Drummond, County Kildare (EIAR Figure 4.50). This is the proposed Principal Construction Compound (CC6) for the Treated Water Pipeline from the BPS to the TPR, and the TPR itself.

86. In addition to these four Principal Construction Compounds, there would be four secondary Satellite Construction Compounds (CC0, CC3, CC4, CC7). These would be needed to build the other Infrastructure Sites and so have been located at the RWI&PS, BPT, BPS and TPR (the WTP is a Principal Construction Compound). These Satellite Construction Compounds will provide materials storage and support plant and workers along the route to allow for an efficient construction programme. This will, for example, help to reduce traffic to and from Principal Construction Compounds.

87. The nine Pipe Storage Depots will take direct delivery of the pipe for storage before onward transfer to their required location along the pipeline. Given the volume of pipe material to be delivered and the logistical scale of the Proposed Project, it is not considered feasible to deliver pipe material directly to the point of installation. The pipes will be transported from the Pipe Storage Depots to their installation location via either the Haul Road network or directly along the Construction Working Width.

88. A high level overview of the location of the Construction Compounds and Pipe Storage Depots is shown in Image 1.3.



5.3.2 Haul Routes

89. Haul Roads are part of the public road network which have been designated for the movement of construction materials, plant and workers to, from and between the Infrastructure Sites, the pipeline and temporary works areas such as the Construction Compounds and Pipe Storage Depots. They include national, regional and local roads.
90. The Haul Roads have been determined based on a review of all potential road crossings/access points for traffic to and from the Infrastructure Sites, Construction Working Width, and temporary works areas; and based on the identification of those road crossings/access points with the potential capacity to accept a large number of vehicle movements.
91. The Haul Roads considered suitable for the construction of the Proposed Project have been determined in consultation with TII and the Local Authorities most directly impacted by the Proposed Project. Figures 5.18 to 5.26 of the EIAR show the Haul Roads by local authority area, as follows:
- Dublin City Council/Fingal County Council/South Dublin County Council (Figure 5.18)
 - Kildare County Council (Figure 5.19)
 - Laois County Council (Figure 5.20)
 - Offaly County Council (Figure 5.21)
 - Tipperary County Council (Figure 5.22)
 - Galway County Council (Figure 5.23)
 - Clare County Council (Figure 5.24)
 - Limerick County Council (Figure 5.25)
 - Cork County Council (Figure 5.26).
92. For the construction of the proposed 38 kV Uprate Works, the public road network (including regional and local roads) would be used for the delivery of materials, plant and equipment from an ESNB Depot to the development corridor and individual infrastructure locations. The proposed Haul Roads in the immediate vicinity of the 38 kV Uprate Works are indicated in Figure 5.24 of the EIAR. All other proposed Haul Roads for the 38 kV Uprate Works are as for the wider Proposed Project (EIAR Figure 5.18 to Figure 5.26 inclusive). The proposed Haul Roads for the 38kV Uprate Works have been discussed and agreed with the relevant Local Authorities.
93. The use of the Haul Roads will be managed through the measures set out in the Traffic Management Plan that has been prepared (Appendix A7.2 of EIAR Chapter 7, Traffic & Transport).
94. No abnormal loads, as defined in S.I. No. 5/2003 – Road Traffic (Construction and Use of Vehicles) Regulations 2003 and the Road Safety Authority Guidelines on Maximum Weights and Dimensions of Mechanically Propelled Vehicles and Trailers, Including Manoeuvrability Criteria (Road Safety Authority 2023), are required for the Proposed Project.

5.4 Good Housekeeping

95. The Contractor will ensure good housekeeping practices on site to prevent nuisance incidents at nearby property, uncontrolled releases of pollution, accidents and/or general complaints from the public. This will include, but not be limited to, the following requirements:
- General maintenance of working areas and cleanliness of welfare facilities and storage areas

- Awareness of material storage arrangements at induction and through toolbox talks. Materials will be stored in a designated area in an organised manner so as to protect them from damage, deterioration and loss
- Provision of site layout maps showing key areas such as first aid posts, material storage, spill kits, material and waste storage and welfare facilities
- Weekly environmental inspections to identify any evidence of poor housekeeping practices
- Maintenance of all construction plant, material and equipment and ensure these are in good order, clean and tidy
- Construction compounds, access routes and designated parking areas free and clear of waste material and recyclates
- Details of site managers contact numbers and public information signs (including warning signs) to be provided at the boundaries of the working areas
- Provision of appropriate welfare facilities for site personnel at all compounds and depots
- Installation of appropriate security, lighting, fencing and hoarding at each working area
- Effective prevention of fuels, oil, grease or other polluting matter being discharged from any working area
- Provision of appropriate waste management facilities at each working area and regular collections to be maintained
- Site drainage to be in accordance with the Surface Water Management Plan (Annex A)
- Installation of fencing and signage around any known invasive species
- Protection of environmental assets and features within the Construction Working Width
- Maintenance of footpaths, diversions and other provisions for pedestrians, cyclists and other non-motorised users.

5.5 Worksite Layout

96. The Contractor will ensure that the site layout and appearance will be designed using the following principles:

- All Construction Compounds and Pipe Storage Depots will be bounded by hoarding. Sites at prominent locations along the Construction Working Width will also be screened by hoarding
- All sites will be fully secured via fencing and/or hoarding, secure gates, site security and CCTV
- Existing features will screen the sites where appropriate
- Storage sites, fixed plant and machinery equipment and temporary offices will be located to avoid or reduce adverse environmental effects, while considering the constraints of each site
- Site lighting will be located and directed so as not to intrude into occupied residential properties or sensitive areas identified in the EIAR, or constitute a hazard to transport modes
- Where required, tall plant e.g. cranes, will be assessed in relation to potential risks (e.g. proximity of the TPR site to Baldonnell and Weston Airfields).

5.6 Site Lighting

97. The general approach that will be taken to construction lighting is set out in Section 5.8.3.7 of EIAR Chapter 5 (Construction & Commissioning). A Site Lighting Plan will be prepared for each construction site and will:

- Provide a consistent and safe approach to site lighting

- Provide the appropriate level of lighting that allows construction work to be completed safely and effectively
 - Provide the most appropriate type of lighting that minimises carbon footprint and is energy efficient
 - Adopt a proactive approach to reduce light pollution and trespass
 - Improve the overall safety of the workers and travelling public.
98. The Contractor must ensure that every construction site is provided with adequate power supply and distribution on site, suitable and sufficient temporary lighting, natural light, and suitable and efficient specific task and emergency lighting/routes where needed.
99. The lighting provided to light up each construction site will be designed by the Contractor or their representative to suit the construction methodology and equipment used at that site/location. It will provide a safe working environment within the construction site, without blinding or obstructing traffic, pedestrian, cyclists nor impact environmentally sensitive areas around the site.
100. The lighting towers and equipment will be designed and positioned to illuminate within the working area only and with minimum impact on surrounding receptors.
101. Additional mitigation in relation to light disturbance on bats is set out in the REAC (Annex G).

5.7 Working in Peat

102. The approach that will be taken for pipe-laying works in areas of peat is set out in EIAR Appendix A5.3 (Methods of Working in Peat). This document describes four principal laying methods in areas of peat, three of which would require access along the pipe route by means of a floating road. Additional construction methods for working in peat are also set out in Appendix A5.3, including temporary drainage, methods for managing peat instability, access, storage of material, use of surplus material, and reinstatement.

5.8 River Works

103. The Contractor will use the appropriate methodology as set out by the following guidelines:
- IFI – Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI 2016)
 - National Roads Authority (NRA) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA 2008).
104. A SWMP is included in Annex A which details the mitigation and monitoring that will be used, where required. This is a live document that will be developed by the Contractor in line with amendments to the CEMP. Approval and consultation with IFI will be obtained in advance for crossings, diversions and work affecting watercourses. Watercourses (including land and/or road drainage) within the construction sites will always be maintained in order to provide effective working conditions. Planned and managed measures in line with the SWMP will be taken throughout the Construction Phase to prevent the deposition of silt, or other material arising from works, in any existing watercourse or other water environment feature.
105. Watercourse culverts are subject to regulation under Section 50 of the Arterial Drainage Act 1945, as amended. Compliance is managed by the Office of Public Works (OPW). Requirements for watercourse culverts are stipulated by the OPW (2019) and will take precedence to requirements outlined in this standard.

5.9 Security

106. Security will be the responsibility of the Contractor, who will provide adequate security to prevent unauthorised entry to or exit from any working areas. The following measures will be used to prevent unauthorised access:

- Fencing around the sites to minimise the risk of vandalism and unauthorised access. This process will be made easier by all operatives possessing an ID card. ID Cards will only be issued to operatives who have attended the site induction
- Installation of CCTV and alarm systems, where required
- When there is no site activity, close and lock site gates and implement appropriate site security measures.

5.10 Existing Utilities

107. Prior to works commencing, appropriate site surveys will be undertaken to identify existing utilities including underground surveying techniques, such as a Cable Avoidance Tool (CAT) and a Signal Generator (genny) and/or surface radar scanning will also be used to help confirm the presence of utility services before commencement of any mechanical excavation in the vicinity of underground services.

108. The full Construction Working Width will be scanned using a CAT to confirm the positions of existing services and infrastructure which may affect the works.

109. Method Statements will be developed by the appointed Contractor(s) to ensure that all underground services are located manually, marked and carefully protected prior to any construction activities commencing. This will avoid the risk of service strike which would lead to a loss of services to end users (homes and businesses).

110. The contract-stage ground investigation will include mapping and electronic verification of the position of known services, and at the Construction Phase the position of these services will be exposed and marked before works commence near them.

111. Liaison will be undertaken with the owners / operators to agree matters including but not limited to:

- Timing of works
- Temporary works and provision of temporary supplies (if required)
- Depth of crossings
- Programme of monitoring programme, where required.

112. In addition, landowners will be consulted to help identify known services on their lands.

113. The horizontal and vertical construction flexibility defined in EIAR Chapter 4 (Proposed Project Description) and 5 (Construction & Commissioning) allows for required separation distances to be achieved.

114. Further, the alternative methods for working in peat as referred to in Section 5.7 will not be used where, to do so, would result in a conflict with existing utilities.

115. These services will be marked with hi-visibility plastic fencing, and warning signage and bog mat protection where required, as described in Chapter 5 (Construction & Commissioning).

5.11 Emergency Response Plan

116. A set of standard emergency response procedures will govern the management of emergency incidents. The Contractor will be required to detail emergency incident response procedures in the CEMP and to develop an emergency response plan. While the Emergency Response Plan will be specific to the Contractor, the below section outlines the general framework that will be adopted when developing the plan.
117. The emergency response plan will contain emergency phone numbers and the method of notifying local authorities, statutory authorities and stakeholders. Contact numbers for key personnel will also be included. The Contractor will be required to adhere to and implement these procedures and ensure that all staff and personnel on site are familiar with the emergency arrangements. In addition, designated staff will be trained in spill management, minor firefighting and first aid.
118. The Contractor will consult with the relevant statutory authorities, stakeholders and other parties, such as the Health and Safety Authority, the Environmental Protection Agency (EPA), the local Fire Brigade, the Ambulance Service, utility companies, and relevant county councils, when preparing and developing response measures. Further, if any sensitive receptor is impacted, the appropriate environmental specialists will be informed and consulted with accordingly.
119. In addition to the emergency response plan, the Contractor will prepare a spill response procedure and implement this procedure if such an incident occurs (refer to Section 5.11.1).
120. Furthermore, the Contractor will implement a process within 48 hours of the incident occurring or as otherwise agreed by Uisce Éireann to:
- Identify and put in place measures to avoid reoccurrence of the incident
 - Identify and put in place any other appropriate remedial action
 - Carry out environmental monitoring where required.
121. Details of close-out of all incidents will be submitted to Uisce Éireann in the monthly environmental report and will include the following information as a minimum:
- Date and location of the incident
 - Details of the reporting procedure followed
 - Description of the incident
 - Remedial actions
 - Lessons learnt
 - Details of any contact with regulatory bodies.

5.11.1 Spill Response

122. The Contractor will develop and implement a procedure for spill response. This procedure will detail the practical measures to be implemented in order to respond to pollution incidents and shall have regard to best practice measures and guidance. The procedure will apply to all site personnel, including sub-contractors and consultants. The plan will detail the procedure to deal with any spill incident that may occur, including response procedures, timescales and notification procedures to be implemented in order to minimise the effects.
123. In the event of a spill occurring the following general spill response would be implemented:
- Immediately contain the source (if feasible)

- Protect any pollution pathways for example drains and watercourses
- Absorb the spill by using spill response materials
- Dispose of the used spill materials (in line with relevant regulatory requirement for disposal of waste)
- Report any emergency or incidents to the Construction Manager and/or Environmental Manager immediately.

124. Spill response materials would be readily available and easily accessible onsite, with all staff trained in their usage. The content of spill kits would differ depending on the nature and location of the works. Typical spill equipment is identified below, which is suitable for use in different situations and ways:

- Bulk/loose powder/granules – especially suited for use on hard-standing areas such as roads and concrete floors, absorb most liquids; apply to spill, agitate and sweep up
- Booms/socks – used to contain and prevent the spread of a pollutant; place around a spill to block its path, overlapping ends in direction of flow; can be placed as a precautionary measure, e.g. across a river
- Pads and rolls – large surface area, place directly onto the pollutant to absorb and recover it; rolls can be cut to size to reduce wastage
- Drain mats – made of reusable polyurethane or single-use bentonite clay; used to prevent spillages entering drainage systems
- Sealing putty – can be applied to a damaged container to seal the leak.

5.11.2 Accidental Watercourse Pollution

125. Section 3 of the SWMP (Annex A) sets out measures to be followed in the event of an incident or emergency where sediments or other contaminants have entered or are at an imminent risk of entering a watercourse or drain. Further detail on monitoring measures in relation to watercourses is set out in Section 7 of the SWMP.

5.11.3 Fire Response

126. The Contractor will incorporate and develop the following instructions in their Emergency Response Plan for the site in the event of an accidental fire:

- If safe to do so use fire beaters immediately to prevent fire spreading
- Report any emergency to the Construction Manager immediately
- Call the fire brigade if the fire cannot be easily contained
- Coordinate with Uisce Éireann's LLOs to inform the landowner/occupier.

5.11.4 Weather

127. A 'weather warning response plan' will be developed as part of the Emergency Response Plan to instruct the actions to be taken in the event of a severe weather warning being issued by the Met Éireann and/or a flood warning. This will be a live document that undergoes monitoring, review and update throughout the lifetime of the Proposed Project.

128. Activities on-site will be monitored to avoid risk, including from climate change related impacts, increasing over time on the site. It will consider all measures deemed necessary to manage extreme weather events including training of personnel and prevention and monitoring arrangements. The document will also consider emergency preparedness and contingency procedures in place for an extreme weather event on the construction site or within the supply chain.

5.12 Site Clearance on Completion of Activities

129. The Contractor will clear and clean all working areas and accesses as work proceeds and when no longer required for works. The Contractor will reinstate all working areas and access routes as work proceeds during construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity. All land, including roads, footpaths, public open spaces, river embankments/waterways, loading facilities or other land occupied temporarily will be made good to the satisfaction of Uisce Éireann and the landowner.

6. Environmental Management

130. This CEMP describes the environmental management activities identified in the EIAR, NIS and Water Status Impact Assessment Report that the Contractor will be responsible for implementing. The activities relate to measures such as legislative compliance, general good practice and established construction techniques that can be adopted to avoid, reduce, mitigate and offset adverse environmental effects. Standard good practice is set out in Section 5 (General Site Operations) and the specific management plans included in Annex A to Annex F. Specific mitigation proposals – bespoke mitigation measures that are required during the construction, commissioning or operational phase of the Proposed Project to avoid or reduce environmental effects – are presented in the REAC in Annex G, including proposed monitoring.
131. Each measure in the REAC is assigned a unique ID number for future reference. The REAC provides details of the measure or commitment, the objective of each commitment, its source reference within the EIAR, achievement criteria, the owner of the action, monitoring requirements and confirmation of which stage of the Proposed Project the activity is required.
132. The CEMP and the REAC provide the environmental commitments that will be built upon by the Contractor when developing the CEMP. This will be based on the measures in this CEMP submitted with the planning application, amended as required to reflect the requirements and conditions of the development consent issued by An Coimisiún Pleanála in addition to any additional requirements identified in the tendering process.
133. The REAC will be updated by the Contractor as required as the Proposed Project progresses to track progress of the commitments and record outcomes and evidence of the actions taken, as well as recording and addressing any additional environmental issues that arise during construction.

7. References

Inland Fisheries Ireland (IFI) (2016). Guidelines on protection of fisheries during construction works in and adjacent to waters.

Irish Water (2022). Regional Water Resources Plan - Eastern and Midlands.

International Organisation for Standardisation (ISO) (2015). ISO 14001:2015 Environmental Management Systems.

National Roads Authority (NRA; now known as Transport Infrastructure Ireland) (2008). Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes.

Office of Public Works (OPW) (2019). Construction, Replacement or Alteration of Bridges and Culverts. A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945.

Road Safety Authority (RSA) (2023). Guidelines on Maximum Weights and Dimensions of Mechanically Propelled Vehicles and Trailers, Including Manoeuvrability Criteria.

8. Annexes

Annex A – Surface Water Management Plan

Annex B – Soil Management Plan

Annex C – Construction Waste and By-product Management Plan

Annex D – Noise and Vibration Management Plan

Annex E – Dust Management Plan

Annex F – Invasive Species Management Plan

Annex G – Register of Environmental Actions and Commitments

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1 Annex A) Surface Water Management Plan

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Acronyms and abbreviations

Acronym	Meaning
BPS	Booster Pumping Station
BPT	Break Pressure Tank
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
COD	Chemical Oxygen Demand
EIAR	Environmental Impact Assessment Report
EM	Environmental Manager
EPA	Environmental Protection Agency
ESBN	Electricity Supply Board Networks
FCV	Flow Control Valve
FRA	Flood Risk Assessment
IFI	Inland Fisheries Ireland
NPWS	National Parks and Wildlife Service
OPW	Office of Public Works
PCAS	Peatlands Climate Action Scheme
REAC	Register of Actions and Commitments
RWI&PS	Raw Water Intake and Pumping Station
RWRM	Raw Water Rising Main
SuDS	Sustainable urban Drainage Systems
SWMP	Surface Water Management Plan
TAG	Technical Advisory Group
TPR	Termination Point Reservoir
TSS	Total Suspended Solids
WFD	Water Framework Directive
WTP	Water Treatment Plant
WwTP	Wastewater Treatment Plant

1. Introduction

1.1 Purpose of the Surface Water Management Plan (SWMP)

1. This SWMP is an Annex to Appendix A5.1, the Construction Environmental Management Plan (CEMP). It details specific (where required) and generic control and mitigation measures for avoiding, preventing or reducing any likely significant adverse effects on the surface water environment during construction, as identified in Chapter 9 (Water) and associated technical appendices.
2. For ease of reference with measures contained in the Register of Actions and Commitments (REAC) and associated assessment reports, all specific mitigation measures have been assigned with a corresponding ID number (W-SC for construction phase and W-SO for operational phase).
3. The specific measures outlined in the SWMP are consistent with those detailed within the Chapter 9 (Water) suite of documents. The 'generic' measures are those best practice approaches that can be used to protect surface waters during the construction stage of a project. This is a working document and will be finalised by the appointed Contractor following appointment and prior to commencing works on site to include any additional conditions stipulated by An Coimisiún Pleanála.
4. All of the content provided in this Plan will be delivered by the appointed Contractor¹ and its finalisation by the appointed Contractor will not affect the robustness and adequacy of the information presented here and relied upon in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS).

1.2 Guidance

5. Control and mitigation measures have been identified with reference to the following guidelines:
 - Construction Industry Research and Information Association (CIRIA) (2001). C532 Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors
 - CIRIA (2006a). C648 Control of Water Pollution from Linear Construction Projects: Technical Guide
 - CIRIA (2006b). C649 Control of Water Pollution from Linear Construction Projects: Site Guide
 - CIRIA (2010). C689 Culvert Design and Operation Guide
 - CIRIA (2015). C741 Environmental Good Practice on Site Guide
 - National Roads Authority (2006). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes
 - Office of Public Works (OPW) (2021). Design Guidance for Fish Passage on Small Barriers
 - Inland Fisheries Ireland (IFI) (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters
 - United States Forest Service (2008) Stream Simulation: an Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings
 - Enterprise Ireland (2003). Best Practice Guidelines BPGCS005 - Oil Storage Guidelines.

¹ Any reference to the appointed Contractor is assumed to mean any of the Contractors Uisce Éireann may appoint for the Construction Phase of the Proposed Project.

1.3 Summary of the Requirements of the SWMP

6. Table 1.1 provides headlines of the requirements of the SWMP, who is responsible and where details can be found in this document.

Table 1.1: SWMP Requirements

Role	Responsibility	Section of SWMP
Appointed Contractor	SWMP	Whole Document
	Incident Response Plan	Section 3
	Generic Site Establishment and Control Measures	Section 6
	Compounds	Section 6.1
	Control of Sediment	Throughout document
	Use of Concrete	Section 6.3
	Vehicles and Plant	Section 6.5
	Specific Control and Mitigation Measures	Section 4 and Section 5
	Structures	Section 4.5
	Compounds	Section 4 and Section 5
	Watercourse Crossings	Section 4
	Monitoring	Section 7.1
	Water bodies	Section 7.1
	Conformance with SWMP	Section 7.1 and Section 7.2
Record keeping of any incidents of non-conformance	Section 7.2	
Employer	Inspection and auditing of implementation of SWMP	Section 7
	Meetings with appointed Contractor's Environmental Manager	Section 7
	Conformance with Project SWMP	Section 7
	Record keeping of any incidents of non-conformance	Section 7

1.4 Potential Sources of Water Pollution

7. The main activities/areas where sediment and surface water runoff and pollution generation have the potential to arise include earthworks, accidental spillages and releases, and the use of concrete.

1.4.1 Earthworks

8. There is potential for pollution to occur during excavations and other earthworks as follows:
- Excavation, processing and transportation of materials (within and outside of the proposed development boundary) and deposition of materials and stockpiling
 - The most significant area of concern regarding sediment control for the Proposed Project is at watercourse crossings for the proposed pipeline where soils and riverbed substrates would be disturbed and exposed
 - During the construction of principal infrastructure sites such as the Raw Water Intake and Pumping Station (RWI&PS), the Water Treatment Plant (WTP), the Break Pressure Tank (BPT), the Booster Pumping Station (BPS), the Flow Control Valve (FCV) and the Termination Point Reservoir (TPR), soils would also be disturbed and exposed

- There is a higher likelihood of impacts to water quality when earthworks are taking place near to or within surface waters, therefore surface water via drainage networks, watercourse crossings (particularly open cut) and any in-stream works or riverbank works are considered to be higher risk activities
- Typically, substrates and soils are likely to be exposed during the following activities associated with the Proposed Project:
 - The initial site clearance works/topsoil strip
 - Tracking of machinery
 - Excavation for building foundations or trenches
 - Damming, diversions or over-pumping of watercourses.

1.4.2 Accidental Spillages and Releases

9. There is potential for accidental spillages and releases of pollutants where materials are stored and/or refuelling takes place, including construction compounds and mobile refuelling areas and potential spillage from hydraulic pipe failure on machinery, leaking pumps etc.

1.4.3 Use of Concrete

10. Concrete, grout and other cementitious materials are highly alkaline and can generate very fine, highly alkaline silt (pH 11.5). There is potential for these sources of pollution during the construction of the principal infrastructure sites; RWI&PS, WTP, BPT, BPS, FCV and TPR.

2. Roles and Responsibilities

2.1 Employer

11. A suitably qualified person will carry out the inspection/monitoring of the surface water management regime on behalf of the Employer. The results will be stored and will be available for inspection/audit by the Employer, appointed Contractor and regulatory bodies such as National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA), IFI and the OPW where relevant. All inspections/monitoring and results will be recorded on standard forms. Inspections will include the following:
 - A review of the Control Measures outlined in this (and any subsequently updated) SWMP and their implementation on a regular basis. Findings will be discussed with the appointed Contractor and reported to the Employer
 - Spot inspections of activities deemed to be high risk such as wheel wash facilities, stockpiles, concrete operations and site compounds
 - Where the Employer's auditor considers that the risk of pollution is high for a particular construction activity, they will require the activity to cease, inform the appointed Contractor and request protective action to be taken before the construction activity re-commences. The Employer will delegate powers under the contract sufficient for these instructions to be issued and implemented.
12. Where required, works will be undertaken with oversight from an Environmental Manager.

2.2 Appointed Contractor

13. As set out in the CEMP, the appointed Contractor will appoint an Environmental Manager (EM) to ensure the successful development, implementation and maintenance of the CEMP, including this Annex, the SWMP.
14. A detailed monitoring regime will be prepared by the EM, including the measures set out in Section 7 of this SWMP and it will include procedures for the recording of findings and both the management and reporting of high-risk activities, incidents and 'near-misses'. The EM will be responsible for implementing the monitoring regime during the Construction Phase.

3. Incident Response Plan

3.1 Introduction

15. All aspects of the Works will be designed to be watertight. This includes the pipelines, tanks, storage containers, and valve chambers. The specification of pipe materials, fittings, joints, bedding and backfilling details will ensure the integrity of the pipelines and minimise the possibility of any leaks. The design of reinforced concrete structures to be water-retaining and the use of bunds on impervious bases which are able to contain at least 110% of the volume stored around any chemicals and oil storage areas, will reduce the risk of any leaks or accidental spillages.
16. An Incident Response Plan will be prepared by the appointed Contractor to ensure that, in the unlikely event of an incident, response efforts are prompt, efficient, and suitable for the particular circumstances. The plan will be a working document and will be maintained and updated by the appointed Contractor during the Construction Phase. The plan will include measures to address surface water related incidents such as accidental spillages of noxious substances e.g. oil and significant releases of sediment or concrete washings, such as those set out in Section 3.2.

3.2 Spillages

17. Accidental spillages and releases could lead to a serious pollution incident. In order to reduce the likelihood of occurrence and the likely impact should such an incident occur; the following measures will be implemented:
 - A detailed method statement including pollution prevention measures will be prepared prior to commencement of works. All subcontractors and staff will be made aware of its contents and their responsibilities
 - Pollution control measures will be included in all method statements and all staff will be made aware of their contents and their responsibilities
 - Staff will be trained in the implementation of the Incident Response Plan and the use of any spill control equipment as necessary. A training log will be maintained and updated regularly
 - In the event of an accidental spill, procedures and contingency plans will be in place at each work site to address cleaning up small spillages as well as dealing with an emergency incident
 - In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material will be properly disposed of to an authorised waste contractor
 - Spill kits will be provided at high risk and/or sensitive sites
 - Safe handling and legal disposal of contaminated materials and wastes resulting from an incident will be clearly defined
 - A reporting procedure will be in place for recording pollution incidents for review and future actions for prevention, mitigation and training prior to commencement of construction.

3.3 Accidental Releases

18. Continuous monitoring of water quality will take place at the outlets from attenuation areas, any settlement lagoons, surface water attenuation ponds or bioswales across the Proposed Project. If hydrocarbons are observed or other water quality parameters are considered to be exceeded, discharges will be suspended until the quality of the water is of a standard acceptable for discharge.
19. In addition, daily visual inspections of the surface drainage and sediment control measures and the watercourses will be undertaken by the appointed Contractor in line with Safety, Health and Welfare at Work (Construction) Regulations 2013.

20. These inspections will be recorded. In the event that such indicators are observed, works will cease, and sampling will immediately be undertaken as described for the weekly monitoring, and an investigation of the potential cause will be undertaken by the appointed Contractor.
21. Where the works are identified as the source causing the exceedance, the following will apply:
 - Works capable of generating sediment and all discharges will be stopped immediately
 - The appointed Contractor will be required to take immediate action to implement measures to ensure that such discharges do not re-occur.
22. This monitoring will alert the appointed Contractor to any likely significant adverse effects that construction activities could have on water quality such that appropriate remedial action can be taken as quickly as possible. This will also allow the appointed Contractor to demonstrate the success of the mitigation measures employed in maintaining any sediment release within the 'trigger' value established.
23. More details on the requirements of the monitoring regime are provided in Section 7.

3.4 Flood Inundation

24. The construction of the infrastructure sites for the Proposed Project will result in the creation of additional impermeable surfaces. This could result in an increase in storm water runoff thereby increasing the risk of pluvial and/or fluvial flooding elsewhere. Filtration trenches, attenuation ponds and other measures will be used to attenuate any additional runoff during construction of the infrastructure sites. See Section 5 for more details.
25. The Flood Risk Assessment (Appendix A9.4 Flood Risk Assessment) concluded that there is no impact from the works on the main infrastructure sites on fluvial flood risk as the works are located outside of the 0.1% Annual Exceedance Probability flood extent so would not give rise to a change in channel or floodplain conveyance and storage. The location and elevation of the works mean they would not impact on coastal or estuarine flooding.
26. Construction of the Raw Water Rising Main (RWRM) and Treated Water Pipeline have the potential to give rise to a short-term increase in flood risk from a number of factors including additional runoff, the interception of overland flood flow paths and temporary in-channel works for watercourse crossings. Mitigation measures are outlined in Appendix A9.4 Flood Risk Assessment (FRA) to include no short-term increase in flood risk including the following measures:
 - Temporary runoff storage and attenuation features will be implemented within all active working areas, including the infrastructure sites, to store and attenuate any additional runoff that is generated during construction to greenfield runoff rates
 - Use of combined filter drains, soakaways or similar to receive and attenuate site runoff within active working areas
 - Careful placement of excavated fill to avoid stockpiles in areas prone to flooding or overland runoff
 - Where material stockpiles need to be stored in the floodplain, the following measures will be implemented to ensure there is no increase in the risk of flooding:
 - Minimise the length of stockpiles so they can be bypassed by overland flows
 - Provide culverts through them so they do not block overland flows
 - Sequence works to avoid land subject to seasonal flooding
 - Provide runoff attenuation and control along the Treated Water Pipeline trench to prevent it from acting as a flow conveyance route.

4. Pipeline Specific Control and Mitigation Measures

4.1 Pipeline Trench

4.1.1 Topsoil and Subsoil

27. The topsoil and top layer of subsoil stockpiles will be located away from drains and watercourses (see Section 6.2.3). The location of stockpiles will follow the guidelines outlined in the IFI document 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (IFI 2016).
28. Stockpiles will be protected during construction activities and kept free from the passage of vehicles and plant.

4.1.2 Existing Drainage

29. Drainage measures for groundwater management may be required in some locations to prevent deterioration of the working areas and to prevent excess water collecting in the trenches during construction. Existing drainage lines may be re-routed using a drainage trenching machine so that they continue to function during construction works. These will be installed in accordance with the individual landowner agreements.
30. The construction methodology will ensure that the drainage pattern of either the surface water or groundwater is not altered as a result of the RWRM and Treated Water Pipelines. This will be achieved by using the native excavated material as backfill and avoiding the use of imported granular bedding or surround materials where possible. It will also be achieved by the use of clay 'stanks' which are sections of backfill across the trench formed in an impermeable material, such as natural clay, to prevent unintended longitudinal drainage along the trench.

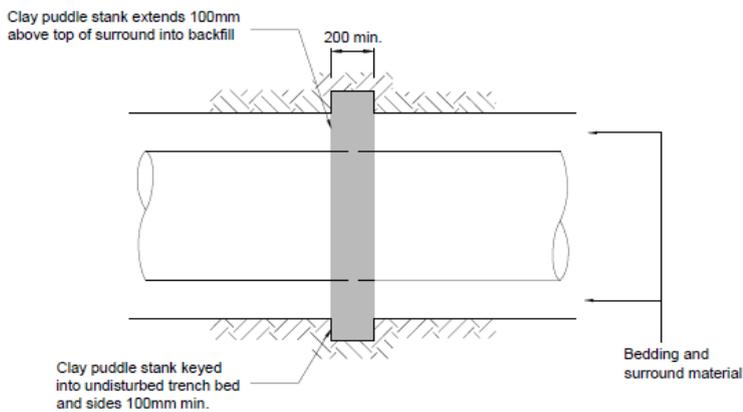


Diagram 4.1: Typical Stank

4.1.3 Silty Water Control

31. A series of measures will be employed along the construction corridor to manage silty water either as a result of rainfall or dewatered groundwater.

4.1.3.1 Toe-Drains (ID W-SC1)

32. During construction of the pipeline, shallow toe-drains will be installed along the edges of the Construction Working Width to intercept overland flows from adjoining lands; they will also catch runoff from the stockpiles of topsoil and subsoils resulting from the excavation of the trenches.
33. During pipeline construction, trenches will not be left open for extended periods of time (more than 2-3 days). Trenches will only be dug to lengths which can be constructed each day. All trenches will be backfilled once the section of pipe is installed. This will prevent pooling of surface waters within open trenches.
34. These toe-drains, which are 500mm to 750mm deep comprising perforated pipe surrounded in 150mm of stone, will drain into temporary attenuation lagoons (Image 4.1) which will be located along the pipeline route at regular intervals, as required, as construction progresses. These will collect surface waters flowing over the Construction Corridor, from the toe-drains, and the groundwater from the pipe trench excavation.

4.1.3.2 Attenuation Lagoons (ID W-SC2)



Image 4.1: Series of Attenuation Lagoons

35. Attenuation/settlement lagoons will be located at low points along the Construction Working Width, making use of the natural topography. The attenuation lagoons represent locations which, through their topography, have the potential to retain large areas of run-off from the surrounding land, or from along the Construction Working Width. Land has been assigned for this purpose within the application boundary.
36. Details of attenuation lagoons will be particular to the Contractor's method of working but will require detailed Pollution Control Plans, Emergency Response Plans and Method Statements, drafted in agreement with IFI and other relevant authorities, and having regard to relevant pollution prevention guidelines, in particular the IFI document 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (IFI 2016).
37. To ensure the drainage pattern of either surface water or groundwater is not altered by the Proposed Project, native excavated material will be used as backfill and the use of imported granular bedding or surround materials will be avoided where possible. It will also be achieved by the use of clay 'stanks, to prevent unintended longitudinal drainage along the trench.

38. The depths of the ponds will be relatively shallow, about 1m, formed directly on the subsoil. The formation layer will be cleared of roots, woody vegetation, oversized stones, rocks or other unsuitable material, and the side slopes will be maintained at a 1:3 gradient. If necessary, and to prevent over topping, an earthen embankment will be provided. Alternatively, a silt curtain (fence) will be provided to capture sediment.
39. The silt curtain filter fabric will be in a continuous roll, cut to the length of the barrier to avoid the use of joints. When joints are necessary, the fabric will be spliced together only at a support post with a minimum 100mm overlap and securely sealed.
40. The likely volume of temporary storage required has been calculated along the length of the proposed pipeline, taking short sections in turn, depending on topography.
41. Where reasonably practicable, the settled surface water will be allowed to soakaway as illustrated in Image 4.2. If this is not possible, a discharge to local watercourses, ditches or road drainage will be considered, as deemed suitable at locations along the pipeline route, and in discussion with the relevant regulatory authorities. There will be no direct discharge of surface waters from within the Construction Working Width without prior attenuation and settlement.

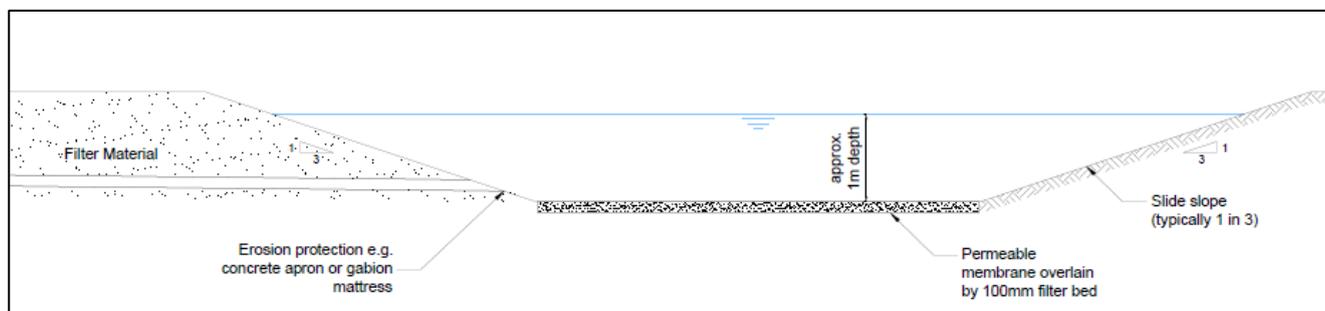


Image 4.2: Typical Section Through Attenuation Lagoon

42. The attenuation lagoons will be sized to ensure final discharge is within the prescribed limit (i.e. $\leq 25\text{mg/L}$ Total Suspended Solids [TSS] in accordance with the Freshwater Fish Directive [2006/44/EC] and Quality of Salmonid Waters Regulations [1988]).
43. They will also cater for spill containment. The treated surface water will be discharged to local watercourses, ditches or road drainage as deemed suitable at locations along the pipeline route. There will be no direct discharge of surface waters from the site without prior attenuation and treatment. Siltbuster tanks will be available for use where TSS exceeds 25mg/l from construction works to fisheries waters or 35mg/l suspended solids from construction works to water bodies in peatland.
44. In addition to the volumes required, locations for the attenuation lagoons have also been identified, which enable surface waters to be managed in short sections.
45. Where the attenuation ponds are located on a slope or for those located within a Wet Grassland or flood plain, generic mitigation may not be enough to sufficiently reduce likely significant effects, therefore additional mitigation measures may be required such as additional silt fencing or sandbags.

4.2 Watercourse Crossings

4.2.1 Trenchless Crossings (ID W-SC3)

46. As an example, Image 4.3 shows how the River Liffey will be crossed using trenchless techniques. This illustration can be taken as being indicative of all trenchless crossings. The layout of the crossing area is designed to avoid impacting on riverbanks and contamination of the river with either dewatering fluid, silty water runoff or bentonite slurry. In particular, the reception and launch pits for the trenchless excavation will be located as per the requirements of the detailed design to be completed by the appointed Contractor, but will be contained within the Proposed Project and will be chosen or engineered such that the fall is away from the water body and beyond the riparian habitat. Soil stockpiles and fuel storage tanks will be a minimum of 10m from the river (CIRIA 2006).
47. The possible release of bentonite slurry during the drilling operation has been identified as a potentially significant issue in Appendix 9.2 (Pipeline Assessment). Chapter 19 (Resource and Waste Management) of the EIAR states that the drilling waste from the Trenchless Installations will be the responsibility of the appointed Contractor. During trenchless construction, the bentonite slurry is reused within the system. The spoil is filtered and separated from the water and bentonite slurry, with the slurry then being recirculated and reused within the system. Liquid sludge from this process is placed under a soil separator and dewatered with a centrifuge or a filter press. The spoil and residual slurry from the drilling will be disposed of off-site to a licensed/permitted waste facility through an appropriately licensed waste contractor in accordance with the Construction Waste and By-Product Management Plan and the Final CEMP to be prepared by the appointed Contractor.
48. All tanks for storage of slurry will be bunded to ensure that any leakages are contained and are not allowed to enter the groundwater and/or nearby surface waters (see Section 6.1.5 Fuel Storage and Section 6.5.2 Refuelling for further details). All bentonite usage will be monitored through materials balance calculations, pressure monitoring in the lines and above ground visual assessment of the works to ensure that, should breakout occur the volume is minimised. Should leakages or breakouts occur, construction work will cease, and the incident responded to immediately with containment, repairs and clean-up of any slurry which has spilled.

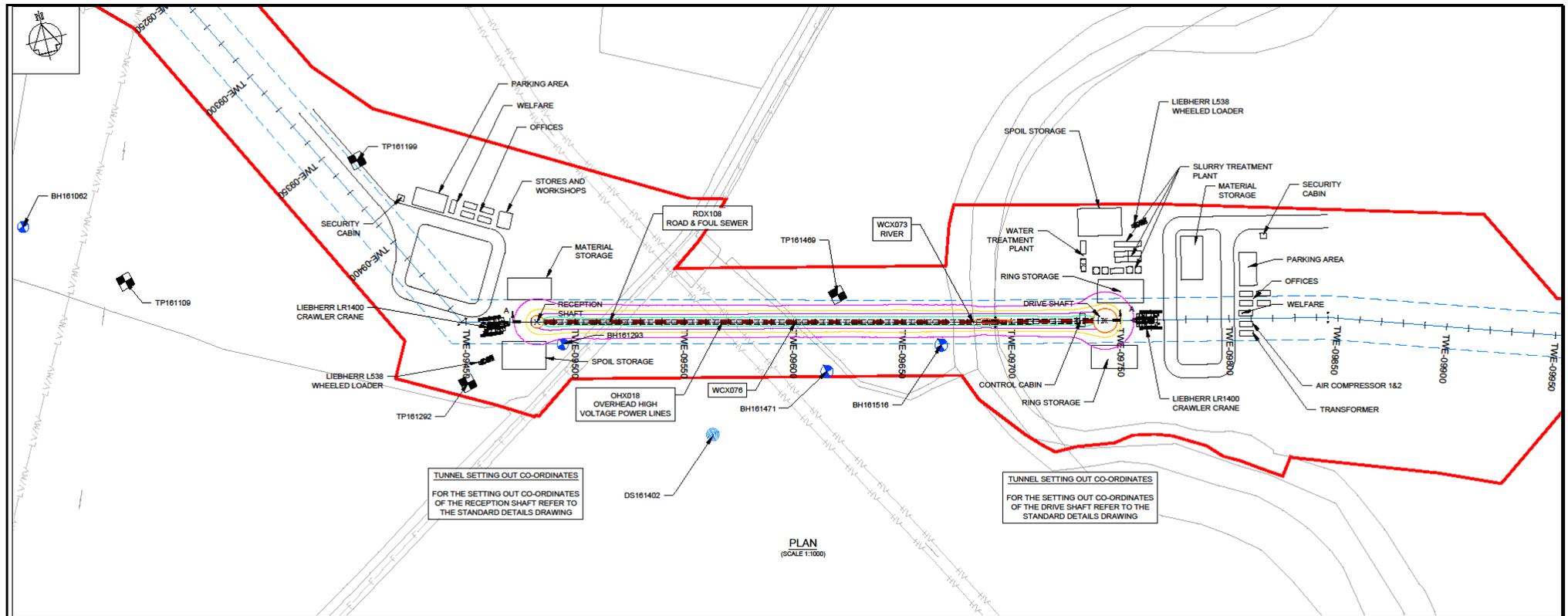


Image 4.3: Liffey_140 Crossing

4.2.2 Open Cut Crossings (ID W-SC4)

49. In-stream working will be carried out in accordance with guidelines issued by IFI i.e. 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (IFI 2016) or as otherwise agreed with IFI during the construction stage. Those aspects of relevance to the Proposed Project are provided in Section 6.3 of this SWMP. This will apply to the watercourse crossings; pipeline trench works near to watercourses; and the construction of permanent outfalls for the washouts.
50. The watercourse banks, channel profile and bed material will be reinstated following construction using natural materials and to a condition at least as good as prior to construction. Post-construction monitoring of these areas will be undertaken to ensure establishment, with remedial works undertaken where required.
51. The natural path and flow of rivers or streams will not be permanently diverted or blocked and there will be no temporary or permanent dewatering of rivers or streams downstream of construction sites save for construction requirements described in EIAR Chapter 5 (Construction & Commissioning). Natural flow rates will be maintained in the channel at all times. Design and choice of temporary crossing structures will provide for passage of fish and macroinvertebrates, protect important fish habitats, and prevent erosion and sedimentation. Prior to construction, the appointed contractors will discuss the specific requirements for any discharges with the relevant authorities. The approach to managing surface water during the construction of the Treated Water Pipelines in all peat areas will follow the standards set by the EPA for Bord na Móna (see Section 4.4).

4.2.2.1 Over Pumping (ID W-SC5)

52. Image 4.4 illustrates an indicative design for open cut crossings where over-pumping will be used. In this scenario, the watercourse will be diverted around the works by 'over-pumping'. The potential issues relating to a build-up of silt or silt laden dewatering fluids will be addressed through the use of settlement tanks at each crossing and the use of silt traps downstream of the dammed area.
53. Sediment mats/silt traps or similar will be placed immediately downstream of the in-river trenching location and adjacent to the watercourse prior to construction to minimise any potential silt loss and to prevent sediment entering a watercourse further downstream. Silt traps will be constructed using a permeable filter fabric as opposed to mesh. The trap will be staked into the banks of the drain such that no water can flow around the sides. The material will be bedded into the drain bed to prevent water flowing beneath it. The height of the trap will be lower than the drain bank heights. The upper edge will be fixed to a timber cross piece. This will allow water to overtop the silt trap and not burst through or around it. The trap works by allowing a build-up of water behind it slowing flow and allowing solids to settle out. Where works are to be undertaken adjacent to water bodies, potential for pollution impacts to close-lying surface water features and their aquatic species may exist. In such instances the installation of silt traps are proposed under the supervision of an Environmental Manager. Inspections of silt traps will be carried out daily during construction.
54. Under the supervision of an aquatic ecologist, spawning gravels encountered (if any) will be removed at the stream crossing points prior to construction works taking place, subject to the prior agreement at all stages with IFI. There will be seasonal constraints on working through, and adjacent to, watercourses which are of a particular ecological interest (See Watercourse Crossing Data in Appendix A8.3 for details of these). Works will be in accordance with IFI Guidelines (IFI, 2016) or as otherwise agreed with IFI during the construction stage.

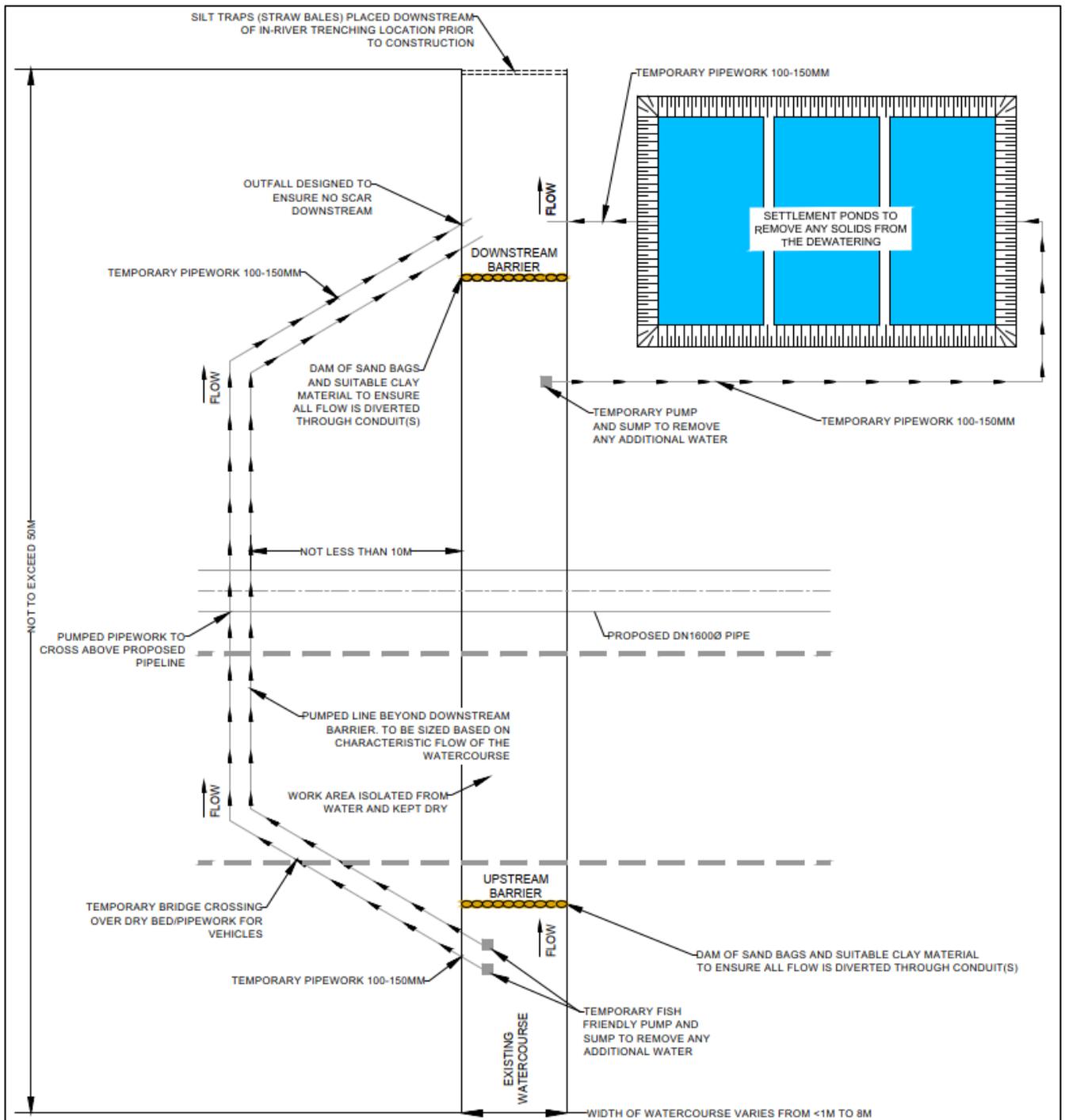


Image 4.4: Indicative Design of Open Cut Crossing - Pumping

4.2.2.2 Fluming (ID W-SC6)

55. Image 4.5 illustrates an indicative design for open cut crossings where fluming will be employed. In this scenario, the watercourse will be diverted around the works by gravity, most likely in an enclosed pipe, as is shown. Here again, the potential issues relating to a build-up of silt, or silty dewatering fluids will be addressed through the use of settlement tanks at each crossing, and the use of silt traps downstream of the dammed area.

56. Whilst the purpose of the flume is to create a dry stream/river bed for the open excavation it may be necessary to employ a temporary pump sump to remove any additional water. Pumped discharge will be via a settlement tank to remove any solids from the dewatering.

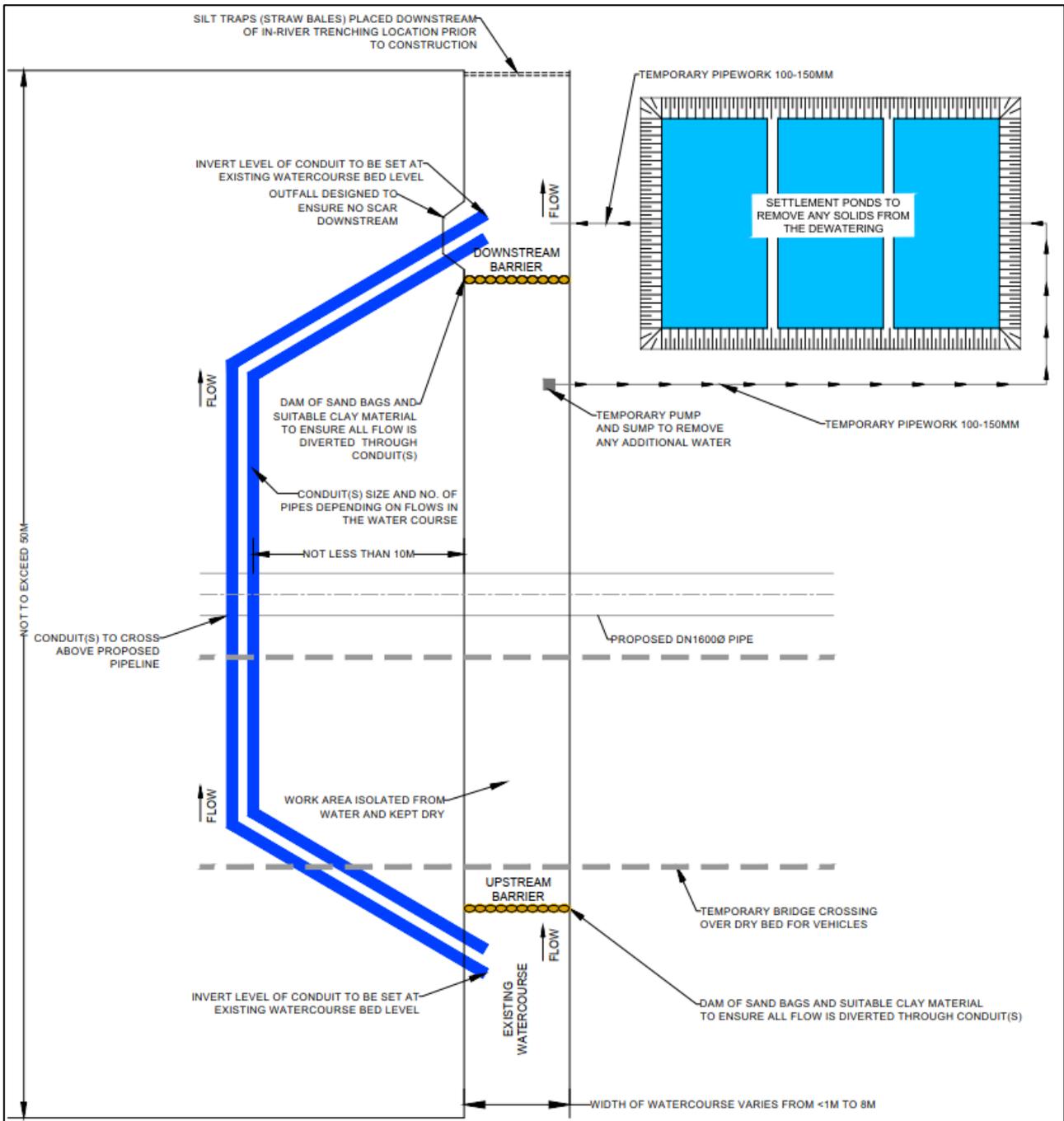


Image 4.5: Indicative Design of Open Cut Installation - Fluming

4.2.2.3 Open Cut Crossings in Areas of Peat (ID W-SC7)

57. There are seven open cut crossings on WFD water bodies in peat areas (WCX034, WCX049, WCX050, WCX051, WCX053, WCX059 and WCX061) and several others on unnamed water bodies, land drains and ditches. Specific measures for working in areas of peat are identified in Section 4.4 (Construction in Peat) of this SWMP. These are also detailed in Appendix A5.3 (Methods of Working in Peat).

58. In areas where there is a significant volume of marl, which is a very fine clay-type soil, it may be more difficult to settle suspended solids within the silt ponds. Slower settling solids may require:
- Additional silt ponds, in series; or
 - Addition of a coagulant, and possibly flocculant, to ensure successful settlement.
59. Coagulants and flocculants are usually metal or polymer-based chemicals and these have been shown to be harmful to aquatic organisms. More recently however, non-toxic bio-coagulants and bio-flocculants have been developed. Therefore, if additional treatment is required to treat the marl, biological based treatment approaches only will be used.
60. Weekly sampling of the silt ponds effluent will be undertaken to ensure compliance with any emission limits set.

4.2.3 Watercourse Crossings by Vehicles

61. Vehicular crossing of all watercourses will be through the use of temporary open span bridges. For open cut crossings, no vehicles will enter the waterbody to cross it.

4.3 Reinstatement (ID W-SC8)

62. Reinstatement of land includes the spreading of subsoil and subsequently topsoil, which are detailed in Chapter 5 (Construction & Commissioning) of the EIAR.

4.3.1 Watercourses

63. The detailed design of works within the watercourses, particularly the reinstatement of watercourses following open cut crossings, will be undertaken with input/guidance from a geomorphologist and ecologist. The reinstatement of the channel cross-sections following the open trench crossings and temporary bridge crossings will include:
- Re-use of existing bed and bank material, placed in layers ordered as removed from the trench
 - Reinstatement of the channel bed and banks flush with the existing bed and banks to prevent preferential erosion immediately following works. Monitoring of these areas will be undertaken to ensure establishment with remedial works undertaken where required
 - Identifying areas at low risk of channel change for placement of structures (e.g. avoiding areas of erosion or deposition)
 - Compacting of the bed and bank material sufficiently
 - Planting of riparian vegetation to minimise erosion from runoff and bank destabilisation.

4.3.2 Trenches

64. Where reinstatement of the pipeline trench occurs near a watercourse, a silt fence will be placed along the riverbank to prevent solids that are washed off the works area during heavy rainfall from entering the stream while the surface adequately re-vegetates. This measure will be particularly important at sites that slope to the edge of a watercourse. Where works are to be undertaken adjacent to water bodies, potential for pollution impacts to close-lying surface water features and their aquatic species may exist. In such instances the installation of silt traps are proposed under the supervision of an Environmental Manager.
65. Typically, a silt fence will incorporate a geotextile filter fabric (Hy-Tex Terrastop Premium silt fence or similar) stretched between a series of wooden or metal fence stakes and will be installed in such a way to create pooling of runoff and thereby allowing sedimentation to take place. Inspections of silt fencing will be carried out daily during construction.

4.3.3 Reinstatement of Drains

66. The reconnection of land drains temporarily altered during construction will be carried out as part of the backfill operation. After the installation of the pipeline, the backfill will be compacted in layers up to the underside of the severed drains which are to be permanently reinstated. The replacement drain will extend into the undisturbed ground on each side of the trench for a suitable distance to ensure a properly supported reconnection can be made (typically 1m or more). The undisturbed ground will be excavated by hand and a good connection formed to the existing drain. The pipeline trench backfill will then be compacted up to the subsoil surface level.

4.4 Construction in Peat

67. Appendix A5.3 (Methods of Working in Peat) describes the various proposed techniques involved in working these areas based on the depths of peat that might be expected to be encountered and the experience of Bord Na Móna in traversing these areas.

68. Similar to the typical Construction Working Width, it will include a surface water filter drain which will intercept overland surface water runoff and direct it away from the trench towards the settlement lagoons. Filter drains will be sited depending on the adjacent topography and may be located either side of the Construction Working Width.

69. To minimise the likely significant effects on water bodies during construction of the pipeline in peat areas, the following specific measures will be implemented:

- **ID W-SC9:** Monitoring of water quality: Water quality will be monitored for seven parameters - pH, total suspended solids, total solids, total phosphorus, ammonia, colour, and chemical oxygen demand (COD) - at key working locations:
 - Before and after crossing water bodies in peat areas
 - Settlement ponds storing surface water runoff from construction works.

This programme will comprise 12-months of pre-construction baseline monitoring to capture seasonal variability and 3-months of post-construction restoration monitoring. Monitoring locations will be assigned in agreement with Bord na Móna.

While standards set by the EPA for Bord na Móna's Integrated Pollution Control (IPC) licence require quarterly monitoring, the nature of the Proposed Project warrants an increased monitoring frequency. Therefore, during active work phases in these peat areas, monthly monitoring will be conducted – except on the following cases:

- Where a work site is near a protected water body; or
- Where a work site crosses through a sensitive area.

In these cases, weekly monitoring is proposed.

- **ID W-SC10:** Daily visual inspection of the waterbody downstream of the crossing will be undertaken to monitor colour and turbidity; pH readings will also be taken to give an indication of excessive ammonia in the water. The Environmental manager can take handheld readings if they observe a change in waterbody colour
- **ID W-SC11:** Where reasonably practicable, works will be carried out in dry conditions to reduce the potential for peat laden runoff to impact the downstream waterbody. Provision will be made to halt work during heavy rainfall / storm events. The extent of exposed peat areas and duration of exposure will be limited due to the temporary nature of the works

- **ID W-SC12: Silt management using settlement ponds and silt fences** (as set out in Section 4.3.2 of the SWMP): These new temporary proposed settlement ponds and their silt fences will be managed and maintained regularly in line with a pollution prevention plan. Water from the settlement ponds will flow onwards to the appropriate active Bord na Móna silt pond at a rate that follows the standards set by the EPA for Bord na Móna to meet its Integrated Pollution Control license requirements
 - **ID W-SC13: Appropriate handling of excavated material:** Temporary storage of excavated peat will be accommodated parallel to the trench and within the Construction Working Width but out with the buffer extents surrounding drains and watercourses. Buffers will be maximised where possible and designed to consider site topography. Note that excavated peat will be re-wet whilst stored in order avoid it drying out and as the settlement lagoons are temporary in nature, they will be decommissioned once active works have ceased in their vicinity and the land made good
 - **ID W-SC14: Appropriate Peat Storage:** Elevated ground close to the construction working width will be kept free from excessive loose peat to reduce the likelihood of runoff to the downstream waterbody. Furthermore, no materials will be stored in areas of deep peat.
70. **ID W-SC15: Managing surface water through peat areas:** The approach to managing surface water during the construction of the Treated Water Pipeline in all peat areas will follow the standards set by the EPA for Bord na Móna to meet its Integrated Pollution Control licence requirements with a focus on good construction management practices and techniques. The licence requirements stipulate flows and water quality as follows:
- a. Maximum flow velocity: <10cm/s
 - b. Silt pond design capacity: minimum 50m³ per nett ha of bog serviced
 - c. Emission Limits Values for water (monitored quarterly):
 - i. Total Suspended Solids (TSS): 35mg/l.
 - d. Trigger level values for water:
 - i. Total ammonia: 3mg/l
 - ii. Chemical oxygen demand (COD): 100mg/l.
71. Sampling of Total Suspended Solids, Total Ammonia and COD (among other standards) is carried out quarterly by Bord na Móna with each outlet being sampled at least once every 2-3 years. A number of the peatland sites / bogs which the Treated Water Pipeline will cross are sampled more frequently (in order to support the PCAS projects). It should be noted that the PCAS monthly sampling will cease in August 2026 with these areas returning to standard sampling at least once every 2-3 years per Bord na Móna license conditions. A summary of the Bord na Móna sampling results is presented in Table 4.1.

Table 4.1: Summary of Bord na Móna Sampling Results

Bog Name	Sampling Frequency	Total Suspended Solids (mg/l)			Ammonia as N (mg/l)			COD (mg/l) (Chemical Oxygen Demand)		
		Mean value	Standard Deviation	Median	Mean value	Standard Deviation	Median	Mean value	Standard Deviation	Median
Ballydermot	Quarterly	3	2	2	0.165	0.175	0.089	70	36	64
Clonad	Monthly	4	5	2	0.300	0.198	0.279	55	24	50
Clonreen	Monthly	5	7	2	0.258	0.199	0.212	36	18	35
Esker Bog	Monthly	5	5	3	0.534	0.734	0.209	52	22	53
Gilltown	Quarterly	3	3	2	1.258	1.012	1.139	71	26	77
Mount Lucas	Monthly	4	3	3	0.209	0.134	0.211	46	15	46
Timahoe North	No sampling as no silt ponds	-	-	-	-	-	-	-	-	-
Timahoe South	Monthly	5	3	3	0.180	0.166	0.118	73	27	74

72. Baseline mean value data for each bog (presented above) demonstrates the presence of significant headroom to the Total Suspended Solids Emission Limit Value (ELV) of 35mg/l. Monitoring will be undertaken to determine any potential exceedances of the ELV in discharge water. For Bord na Móna monitoring, 75% of samples for each monitored discharge cannot exceed the ELV and no sample can exceed 3 times the ELV for Total Suspended Solids - 105mg/l. The Project will use a blanket 35mg/l and monitoring data will be made available to the EPA to support Bord na Móna in meeting its Integrated Pollution Control licence requirements.
73. Baseline mean value data for each bog (presented above) demonstrates the presence of significant headroom to the Ammonia Trigger level value of 3mg/l and COD Trigger level value of 100mg/l. The risk of exceeding these Trigger level values is considered low with the implementation of the mitigation measures listed in this document. The Trigger level values for Ammonia and COD will be used to monitor potential exceedances in discharge water. Note that for Trigger level values (Ammonia and COD), any exceedance is not reportable as an incident, but it must be included in an update to the EPA at the end of each quarter. This data can be used to support Bord na Móna in meeting its Integrated Pollution Control licence requirements.
74. Should the Project be at risk of exceeding the ELV for TSS or Trigger level values for Ammonia and COD, the Project Environmental Manager will implement suitable adaptive management measures to mitigate the likelihood of potential exceedances in discharge water. This will include adjustments to the programme of excavations; methods of stockpiling and control of discharges from settlement ponds. Any exceedances of ELV for TSS or Trigger level values for Ammonia / COD would be investigated by the Project Environmental Manager. Prior to construction, the appointed contractors will discuss the specific requirements for any discharges with the relevant authorities. As a result, in addition to the sampling proposed under ID W-SC9, weekly sampling of the effluent from silt ponds will be undertaken to ensure compliance with any emission limits set.

75. Ditches on Bord na Móna lands, currently used to manage their own discharges will not be used for the settlement of solids. Silty water and runoff from any excavations will be settled in the temporary settlement lagoons and treated before being discharges to Bord na Móna ditches. All water will be discharged at a controlled rate to ensure there is no resuspension of settled solids arising from the Proposed Project in Bord na Móna ditches and will be done in collaboration and agreement with Bord na Móna.
76. Chapter 5 (Construction & Commissioning) and Appendix A5.3 (Methods of Working in Peat) define four methods for working in peat, based on the depth of peat (or alluvium) that would likely be encountered. Method 1 is proposed to be used where the peat is less than 1m deep and it is not expected that there would be any deviation from this methodology. For sections of peat greater than 1m in depth it is uncertain which method may be adopted, and therefore Method 2, 3 or 4 could apply. Methods 3 and 4 would result in additional permanent infrastructure in the form of stone pillars / pile supports below the pipeline. This would not result in additional operational effects for Water.
77. Prior to construction, the appointed contractors will discuss the specific requirements for any discharges with the relevant authorities. Weekly sampling of the effluent from silt ponds will be undertaken to ensure compliance with any emission limits set.
78. Ditches on Bord Na Móna lands, currently used by that organisation to manage its own discharges, will not be used for the settlement of solids. Silty water will be settled before any discharges to them are made and this will be done at a controlled rate to ensure there is no resuspension of settled solids in the ditches. All of this will be done in collaboration and agreement with Bord Na Móna.

4.5 Structures (New Outfalls)

79. In addition to the generic measures set out in Section 6 of this SWMP, the following measures (**ID W-SC16**) will be implemented in the construction of new washouts:
 - Works will be conducted during forecast low flow periods to allow the outfall to be constructed into the bank and onto a dry section of the riverbed
 - A silt curtain will be placed around the new outfall during the construction works to prevent the runoff of silty water into the water body
 - In-stream works will not be carried out in watercourses frequented by salmon or trout during the annual close season and will be undertaken outside of the lamprey spawning season (see also Section 6.3). The timing of works will always be considered on a site-specific basis (typically works can be carried out during the period July to September) and in agreement with IFI, as some rivers have late spawning salmonids
 - The area of disturbance of the watercourse bed and bank will be the absolute minimum required for the installation of the outfall
 - Outfalls will be at a 45-degree angle and in line and at a level with the watercourse bed
 - The headwall will be set back into the channel banks so it is flush with the bank profile
 - The headwall adjacent to the riverbank will be kept free of vegetation and debris and the riverbank will be checked for scour damage and erosion regularly and defects remedied early
 - If clean water from any Principal Infrastructure Site or the RWRM and Treated Water Pipelines is required to be discharged into a watercourse, a baffle will be fitted to the discharge point to prevent disturbance of the watercourse bed.

4.6 Road Crossings

80. Generic mitigation measures are sufficient to avoid likely significant effects at all road crossings therefore no additional, specific measures are required for these activities.

4.7 Construction Compounds and Pipe Storage Depots

81. Generic mitigation measures for construction compounds and pipe storage areas are provided in Section 6.1. These are sufficient to avoid likely significant effects at all Construction Compounds and Pipe Storage Depots, with the exception of culverting of watercourses.
82. Specific measures (**ID W-SC17**) in relation to the potential culverting of surface water receptors under the footprint of construction compounds and pipe storage depots, which occurs at 16 crossing locations:
 - Appropriate design of culvert structures and water body modifications (e.g. realignments) with respect to hydromorphology, and both riparian and aquatic ecology
 - Allowance for the appropriate conveyance of water and sediment for a range of flows (including at low flow conditions) this will include formation of a low flow channel within the culvert where applicable
 - Where culvert gradient requires, baffles will be included in culvert designs for bed material retention and/or to provide resting pools for fish
 - Limitation of culvert lengths through design
 - Close alignment of the culvert with the existing water feature in terms of gradients
 - Roughening of culvert inverts and interiors to help reduce water velocities
 - Where culverts are greater than 25m in length planting should be utilised at the inlets and outlets to smooth the light transition at these locations.

4.8 Testing & Commissioning

83. The Commissioning Strategy sets out a proposed approach to the use of water for the purpose of testing each section of the pipeline. Due to the absence of suitable alternative supplies, the water is proposed to be obtained from watercourses (rivers) along the length of the pipeline.
84. Full details are provided in the Commissioning Strategy included as Appendix A5.2 of the EIAR. Generic and specific environmental control measures, including a decision tree to provide flexibility taking into account the dynamic nature of rivers, are provided at Annexes C, D and E of that document. An overview is given here with regards to the abstraction of water and its ultimate disposal via the washouts.

4.8.1 Abstractions (ID W-SC18)

85. An assessment was undertaken and water bodies with Q95 flow of less than 100l/s were discounted for abstractions. On this basis eight watercourses were selected (which coincide with locations proposed for permanent outfalls for the Washout Valves). These are:
 - Kilmastulla River: Chainage TW - 2300
 - Nenagh River: Chainage TW - 19450
 - Little Brosna River: Chainage TWA - 12900
 - Camcor River: Chainage TWA - 27600
 - Silver River: Chainage TWB - 12600
 - Clodiagh River: Chainage TWB - 24800
 - River Figile: Chainage TWD - 6200
 - River Liffey: Chainage TWE - 9700.

86. River flows in the months preceding the abstraction will be monitored using a combination of OPW data (where available) and the hand-measurement of water levels. It is most likely this will be done from a boat. The rate of abstraction from any watercourse will be appropriate to the size of the watercourse and the prevailing conditions at the time.
87. Abstraction rates will be no greater than 10% of Q95 at flows between Q80 and Q95; below Q95 no abstraction will occur. This more than meets the environmental standards for abstraction for rivers of Good status set by the UK WFD Technical Advisory Group (TAG) (2008).
88. A temporary small-scale intake design of up to circa 2000m³/day (25l/s) will be developed, probably in the form of a suspended cage lowered into the mid-stream but not close to the river bed to avoid drawing in aquatic species that prefer the margins. Abstraction velocities will be kept below 0.15m/s through a fine mesh not greater than 3mm aperture.
89. A number of potential sources of contamination, both in terms of background concentrations and discrete incidents, have been identified including diffuse pollution from agricultural land, discharges from wastewater treatment works, sedimentation from the extractive industries and, specifically for the Kilmastulla, heavy metals from historic mining operations. Discrete incidents include the operation of stormwater and emergency overflows from the local sewer networks and the potential for accidental releases in the form of oil or chemical spills.
90. Given the potential for such contamination, and the importance of not passing on such contaminants to the receiving waterbody, as well as avoiding contaminating the pipe itself, the source of abstracted water will be monitored for biological and chemical parameters for a period leading up to hydrostatic testing and the required water treatment determined based on:
 - Suspended solids
 - Invasive species (e.g. Zebra mussels, crayfish plague)
 - Water chemistry - pH, hardness, conductivity, organics, metals, nutrients, pesticides.

4.8.2 Abstractions from the Camcor and Liffey (ID W-SC19)

91. Two of the water bodies noted above are considered to be more sensitive to change with respect to abstractions because they have existing abstractions for WTPs located downstream. These are the Camcor_30 (Birr WTP 6.9km downstream) and the Liffey_140 (Leixlip WTP 8.4km downstream). Temporary abstractions for commissioning would have likely significant effects during the summer, when the rivers are more susceptible to drought, due to in-combination effects with the existing WTP abstractions.
92. In principle agreements have been reached with the respective Uisce Éireann operations teams that the existing WTPs will reduce their abstractions for the short periods required for the commissioning abstractions (~10 days for the Camcor and ~36 days for the Liffey). Further discussion on the timing and duration of the abstractions will be agreed in advance of commissioning to ensure there is no significant effect on river flows and no risk to the water supplies at these locations.

4.8.3 Discharges (ID W-SC20)

93. Following a successful completion of the hydrostatic pressure test, the water in the pipeline will, where practicable, be retained and pumped into adjacent sections when they are ready for hydrostatic testing. However, in most instances the water will be drained from the pipeline as far as possible to land within the water catchment area from which it was originally taken. Due to the vertical profile of the pipeline this will require the use of every washout along the length of the pipeline. The number of Washout Valves totals 187, of which 39 are confirmed to have permanent outfall infrastructure for discharges to a water body/surface water receptor; 108 will require temporary outfall infrastructure for discharges to water bodies (via flexible hose) and small ditches and field drains; and the remaining 40 will discharge locally to land where possible. There are also 20 Washouts at Line Valves, 18 of which will require temporary outfall infrastructure for discharges to water bodies (via flexible hose) and small ditches and field drains; and the remaining two will discharge locally to land where possible.
94. The following discharge rates will be employed:
- Field washouts will be limited to a maximum of 15l/s
 - Minor water courses will be limited to a maximum of 25l/s
 - Significant water bodies will be limited to a maximum of 20% of QMED, (the Median flow) and also to an overarching maximum value of 150l/s (this limit will be applied to both the hydrostatic test water and sweetening flow during testing and commissioning)
 - Discharges will occur during periods when river flows are lower than the mean flow (typically July to September)
 - Discharges will only occur to receiving water bodies that have sufficient capacity to receive flows from the pipeline without increasing flood risk
 - Discharges will be controlled in accordance with EPA, IFI and OPW requirements and will be subject to the applicable permitting regime.
95. The water to be discharged will require further treatment to remove potential contaminants including silt (from inside the pipe which will not have been cleaned yet at this stage) and chlorine (used to sterilise the abstracted water to prevent contamination from microorganisms). In addition, the pH in the discharged water needs to be the same as that in the receiving water and oxygen levels in the discharge are likely to be low; adjustments to pH and reoxygenation are therefore likely to be required. It should be noted that temperature impacts are not expected due to discharged water being similar in temperature to receiving surface water bodies and no mitigation is therefore required in this respect.
96. Any discharges from the pipeline will be dechlorinated prior to discharge. This will be achieved by using sodium sulphite dechlorination tablets inserted into perforated wire mesh baskets at the washout chamber or permanent outfall structure. Dechlorination is achieved almost immediately on contact with the tablets. This method provides the most flexible approach for the removal of low chlorine residual and is suited to the infrequent operation of the washouts. Residual chlorine will be reduced to <0.005mg/l as required by the Salmonid Regulations.
97. It is not anticipated that site-specific measures will be required as the discharges will be treated such that they can enter any receiving water, at the appropriate discharge rate.

5. Infrastructure Sites: Specific Control and Mitigation Measures

5.1 Raw Water Intake & Pumping Station

5.1.1 Construction Sequencing (ID W-SC21)

98. Chapter 5 (Construction & Commissioning) of the EIAR describes site preparation and dewatering methods that will be employed at the site. The RWI&PS will be constructed in the sequence outlined in Table 5.1. The site will be prepared so as to minimise the ingress of groundwater and surface water to the site.

99. Detail for mitigation measures involved in site establishment are provided in Section 6.1.

Table 5.1: Sequence of Construction Activity - RWI&PS

Sequence	Construction Activity
1.	Site preparation works
2	Topsoil stripping
3	Excavation of groundwater settlement tanks and construction of settled water holding tanks, for use as temporary pump sump for returning settled groundwater to Parteen Basin
4	Construction of Inlet Chambers and Raw Water Pumping Station Building substructure
5	Excavation/reprofiling of Raw Water Intake Basin with concrete revetment mats, and construction of Intake Chamber (for Passive Wedge Wire Cylinder Screens)
6	Construction of Raw Water Rising Mains Scour Tank, Microfiltration Buildings, and Invasive Species Debris Retention Tank
7	Construction of Raw Water Rising Main Swab Chamber, Flow Meter Chamber, Oil Interceptor and Stormwater Attenuation Tank
8	Construction of RWI&PS superstructure
9	Construction of electricity substation and connection to supply
10	Site works, landscaping and boundary treatment

5.1.2 Managing Silty Water (ID W-SC22)

100. Parteen Basin will be protected and a dry area created through the use of secant pile walls which will be installed along the shoreline of Parteen Basin from a temporary piling platform. It is expected that active dewatering of the construction site behind the secant pile walls will be carried out to ensure dry working conditions. Water pumped from behind the secant piled walls will be settled in the Dewatering Settlement Basins on site before being returned to Parteen Basin.

101. The Dewatering Settlement Basins will be constructed as part of the site preparation. In addition to collecting surface run-off, water pumped from excavations will be diverted to these settlement basins. The dewatering flows will be pumped into two lined Dewatering Settlement Basins in sequence, where a hydrocarbon interceptor will be positioned between Basins 1 and 2. The Dewatering Settlement Basins will have the estimated dimensions and volumes shown in Table 5.19 of Chapter 5 (Construction & Commissioning).

102. The findings of permeability tests at boreholes drilled on the RWI&PS site indicate dewatering flows of up to 5 to 15 m³/hr need to be catered for on this site.

103. The retention time of water within the Dewatering Settlement Basins will be in excess of 24 hours, allowing particles to settle. This capture of fine material will be further enhanced by filtering the water through fine mesh textile fabric before pumping the settled water back to Parteen Basin.
104. The second of the Dewatering Settlement Basins will drain through oil interceptors to a temporary pumping station from where the settled water will be pumped back to Parteen basin above the flood level (31.3mOD).
105. Once the construction of below ground works reaches ground level, backfilling of the excavated area and sealing of the substructure will reduce the dewatering volume. The Dewatering Settlement Basins will also be used to accept runoff water discharging downgradient from the Construction Working Width at the RWRMs and from the trench.
106. The use of settlement lagoons in this manner will make sure an appropriate discharge is achieved thereby avoiding impacts on the water quality, levels and flows in Parteen Basin. There will also be no scour or erosion of the banks of Parteen Basin in proximity to the outfall. The settlement lagoons have been sized to make sure that suspended solids could settle out. It is not anticipated that there will be any need for flocculants to aid this process.
107. The intake chamber has been designed to tie in with the existing bank face to prevent preferential erosion upstream and downstream of the structure and will also be inset into the bed of the lough.

5.1.3 Construction Compounds (ID W-SC23)

108. The construction compound at the RWI&PS will accommodate the construction site offices and will be covered in geotextile membrane and overlain with stone following topsoil stripping. This will reduce the amount of bare earth which could otherwise be mobilised during rainfall. The Satellite Construction Compound (CC0) for the RWI&PS will also require the construction of lined Dewatering Settlement Basins, initially for the purposes of ground water management and site runoff but subsequently to act as permanent infiltration basins.
109. Wastewater from the compound welfare facilities will be contained and tankered offsite as and when required and disposed of at a nearby Wastewater Treatment Plant (WwTP).

5.1.4 Secant Piles (ID W-SC24)

110. At the RWI&PS site, secant pile walls will be required to allow work on the intake structure and below-ground sections of the raw water pumping station to proceed in dry conditions, below the prevailing water level outside in Parteen Basin. Further details on the proposed construction of the secant piles are provided in Section 5.17.2.7 of Chapter 5 (Construction & Commissioning) of the EIAR.
111. Secant piles along Parteen Basin shoreline will be constructed from a temporary piling platform which will be constructed within Parteen Basin. This platform could be retained using temporary piling or may be free standing.
112. Silt generated from construction works in Parteen Basin, such as dredging for the gabion mats and construction of the secant piles, will be contained by means of two rows of heavy duty Type 3 silt curtains installed in Parteen Basin around the work areas. Silt generated during construction works will be allowed sufficient settlement time within the water contained within the silt curtains. The silt curtains will be anchored/weighted in place with a float suitable for the site wind/wave conditions. A classification system (United States Army Corps Engineers 1997) divided silt curtains into the following three types, according to the prevailing conditions:

- Type 1 - (Light weight) this is designed for use in lower energy environments where there are no currents and the deployment location is sheltered from any wind and waves
- Type 2 - (Medium weight) this is suited to sites where there is only a small to moderate current of up to approximately 1m/s. Wind and wave action can be present but not considered a major force
- Type 3 - (Heavy-duty) is for sites with higher energy environments, with currents in excess of 1.5m/s. Curtains can be deployed in a tidal region and be subject to wind and wave action.

113. An inspection and maintenance plan will be required to ensure the effectiveness of the silt curtains. Inspection of the screen and anchoring arrangement whilst deployed can best be undertaken through a diver survey. Inspection of the flotation arrangement will be carried out by boat. Turbidity monitors will be deployed downgradient of the proposed works. An Emergency Response Plan will be activated in the event of damage to the silt curtain. Relevant materials and equipment will be available to effect repairs to the silt curtain.

114. Silt generated during construction works will be allowed sufficient settlement time within the water contained inside the silt curtain. Silt/sediment accumulation between the silt curtain and sheet pile will be removed by the use of Sedimats™ or pumped into dewatering silt bags or using other similar methods.

5.1.5 Concrete Revetment Mat (ID W-SC25)

115. A concrete revetment mat (a flexible mat of meshed thin concrete segments with voids) will be installed on the profiled bed of Parteen Basin and used for erosion control in the area immediately outside the intake. The mat will be provided with a small cover layer of granular or other native bed material to provide a surface which can be recolonised by native fauna. This will be installed from the water using a crane and lifting bracket on board a flat-bottomed barge.

116. No refuelling of plant and machinery, or storage of fuel tanks, will take place on the barge (if used) used for transporting excavated material off-site.

117. No refuelling of the barge or the equipment contained on it will be undertaken on the water, all refuelling will take place in port in designated areas (for the barge) and on land for the equipment on the barge.

118. Oil, bilge water and sewage will be contained within the barge itself and disposed of at appropriately licensed sites. With respect to the provision of welfare facilities at the construction site, the wastewater generated from sinks, toilets, washrooms, and showers will be contained in holding tanks on the site and periodically tankered off site and disposed of to a WwTP.

5.2 Water Treatment Plant

5.2.1 Construction Sequencing (ID W-SC26)

119. In order to minimise silty water runoff, the works will be phased such that a greenfield rate of runoff can be maintained across the whole site. Various methods will be employed including contour draining of the WTP site, partitioning the upper undisturbed soil areas into units to be built later, and directing the drainage to the Tank Draindown Management and Commissioning Lagoons. The WTP will be constructed in the sequence outlined in Table 5.2.

120. Detail for mitigation measures involved in site establishment are provided in Section 6.1.

Table 5.2: Sequence of Construction Activity - WTP

Sequence	Construction Activity
1.	Site preparation works
2	Topsoil stripping.
3	Earthworks to reduce existing high ground levels in the western and eastern areas of the site and raise levels at the Water Treatment Module Buildings locations.
4	Installation of site drainage and construction of Tank Draindown Management and Commissioning Lagoons. Raising of levels at treatment buildings using excavated material.
5	Construction of Raw Water Balancing Tanks, Chemical Dosing Manifold Building and temporary water treatment facility to treat raw water pumped from Parteen Basin for use in construction and site operations. Raising of levels at treatment buildings using excavated material.
6	Construction of Backwash Water Tank and Pumping Station, Clear Water Storage Tanks and High Lift Pumping Station. Raising of levels at Water Treatment Module Buildings using excavated material.
7	Construction of Filter "Run to Waste" Equalisation and Settlement Tanks and Filtrate Tanks.
8	Construction of Water Treatment Module Buildings.
9	Raise levels around Filter "Run to Waste" Equalisation and Settlement Tanks and Filtrate Tanks to finished ground levels.
10	Construction of Sludge Dewatering Buildings.
11	Construction of Sludge Storage Buildings.
12	Site works, landscaping and boundary treatment

5.2.2 WTP Access Road (ID W-SC27)

121. The access road to the WTP site will cross a tributary of the Kilmastulla River, immediately north of the junction of the access road with the R445 Regional Road. The bridge will be constructed as a single span structure using precast concrete or steel sections such that there will not be any in-stream works required. The bridge abutments will be constructed at least 5m back from each bank of the stream.

122. While site preparation works are required at the existing disused petrol station (removal of three buildings and above ground petrol pumps), no infrastructure associated with the Proposed Project will be located here. Site preparation works at this location will be required to facilitate the construction of the WTP access road. Local superstructures will be removed; the tank will be emptied of any groundwater ingress (if any) using a tanker and disposed of to a licensed facility. The tank will then be filled with either sand and cement or foam concrete and left in situ.

5.2.3 Managing Silty Water (ID W-SC28)

123. The Tank Draindown Management and Commissioning Lagoons in the south-eastern area of the site, will be one of the first structures constructed at the WTP site. These lagoons will be lined with a permeable liner, working as attenuation lagoons for surface water drainage from exposed excavations and for dewatering flows.

124. The appointed Contractor will be required to partition the sequence of works at the WTP site to optimise the drainage of the site, as the Tank Draindown Management and Commissioning Lagoons will be relied upon to act initially as efficient construction site drainage/settlement lagoons. This will allow the WTP site drainage to be managed during construction, resulting in the least possible earthworks and bare soil face being exposed at a given time. This will be consistent with the necessary sequence of construction of the various units.

125. In constructing a WTP of this scale, the appointed Contractor will not simultaneously open all work areas. Work will be sequenced in an efficient manner to reduce run-off from exposed areas of the site. Consequently, contour draining of the WTP site will be employed which will partition the upper undisturbed soil areas of units to be built later and will direct their drainage around the construction site to the natural drainage system. This will require knowledge of the appointed Contractors' sequence of WTP unit construction and will require contoured partitioning of the 'still clean' and naturally drainable areas of the site from the working areas whose runoff will be managed through the lagoons.

5.2.4 Construction Compounds (ID W-SC29)

126. The construction compound at the WTP will accommodate the Construction Compound offices and will be covered in geotextile membrane and overlain with stone following topsoil stripping. This will reduce the amount of bare earth which could otherwise be mobilised during rainfall. It will require the early construction of its Tank Draindown Management and Commissioning Lagoons to act as temporary Construction Phase lagoons for surface water drainage from exposed excavations for ground dewatering flows.

127. Both the bunded refuelling and plant servicing areas will incorporate a forecourt separator for any potential spillages which may occur during vehicle refuelling and road tanker delivery.

128. The retained contents of the fuel/oil separators will be collected for disposal by a licensed operator to a licensed waste disposal/recovery facility.

129. Wastewater from the WTP Construction Compound welfare facilities will be contained and tankered offsite as required in a licenced manner and disposed of at a nearby WwTP.

130. A concrete batching plant may be required to be established at the WTP (which can also be used to service the RWI&PS site) in the event that local concrete suppliers are unable to meet the Proposed Project requirements. In the event of development of a batching plant, the appointed Contractor will be required to put in place measures to ensure that the highly alkaline cements and concrete wash-water are controlled and not permitted to discharge directly to ground or surface waters.

5.3 Break Pressure Tank

5.3.1 Construction Sequencing (ID W-SC30)

131. The BPT will be constructed in the sequence outlined in Table 5.3.

Table 5.3: Sequence of Construction Activity - BPT

Sequence	Construction Activity
1.	Site preparation works
2	Topsoil stripping.
3	Earthworks to reduce existing ground levels for the BPT substructure to formation level including excavation of the higher area on the northern side; rock stabilization to this northern side because of exposed rock face.
4	Construction of BPT and installation of below ground pipework.
5	Backfill around BPT to finished formation level.
6	Installation of electricity supply.
7	Construction of Control Building.
8	Site works, landscaping and boundary treatment

5.3.2 Managing Silty Water (ID W-SC31)

132. At the outset, the appointed Contractor will stone-out future permeable surfaces on a permeable geotextile membrane to provide a working platform. This will minimise surface water runoff during construction.
133. The appointed Contractor will construct temporary drainage measures to minimise risk of pollution during earthworks construction and other elements of work. This will include the construction of soakaway chambers and filter drains to disperse surface water in a controlled manner. In addition, the proposed site layout will include an infiltration basin at the southern extremity of the site, which will be used for control of any surface water runoff. The latter will be lined with a permeable geotextile membrane/filter material (Diagram 5.1). This infiltration basin will also be used for the control of sediment from the excavation and will be retained for the Operational Phase of the BPT. It has been designed with a volume of 183m³, to accommodate flows from a 1 in 100-year storm, with a 30% uplift for climate change.

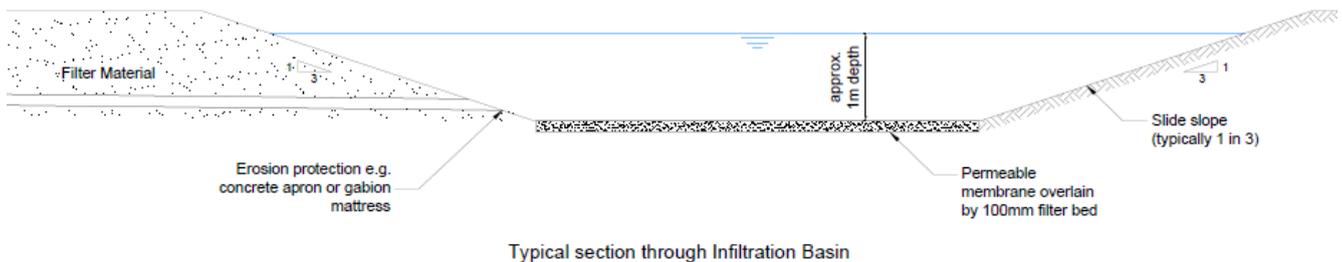


Diagram 5.1 BPT - Typical Section Through an Infiltration Basin

5.3.3 Temporary Concrete Batching Plant

134. A temporary concrete batching plant will be required on-site, if an adequate supply cannot be guaranteed by local suppliers. Refer to Section 6.4 for more information on the use of concrete.

5.3.4 Construction Compounds

135. Generic mitigation measures for construction compounds are provided in Section 6.1. These are sufficient to avoid likely significant effects at all construction compounds and pipe storage depots therefore no additional, specific measures are required for these activities.

5.4 Booster Pumping Station

5.4.1 Construction Sequencing (ID W-SC32)

136. The BPS will be constructed in the sequence outlined in Table 5.4.

Table 5.4: Sequence of Construction activity - BPS

Sequence	Construction Activity
1	Site preparation works.
2	Topsoil stripping.
3	Earthworks, excavation and fill of the land to suitable levels for construction of structures on site. Excavation for BPS substructure.
4	Construction of BPS substructure and installation of below ground pipework.
5	Construction of BPS superstructure
6	Construction of substation including MV Room and installation of electricity supply.
7	Site works, landscaping and boundary treatment.

5.4.2 Managing Silty Water (ID W-SC33)

137. Topsoil stripping will not be carried out within 5m of the adjacent water body (Camcor_30). Bunding or silt fences will be installed along the entire length of the water body as it bounds the site; this will be set back from the water body at least 5m to allow ecosystems alongside the water body to continue to function.
138. At the outset, the appointed Contractor will stone-out future permeable surfaces on a permeable geotextile membrane to provide a working platform. This will minimise surface water runoff during construction.
139. Where topography does not allow the free flowing of surface water towards the attenuation basin, the appointed Contractor will construct temporary drainage measures to minimise risk of pollution during earthworks construction and other elements of work. This will include the construction of soakaway chambers and filter drains to disperse surface water in a controlled manner.
140. Monitoring of the quality of the water in the Camcor_030 will take place daily, through visual inspections at the upstream and downstream extents within the site boundary. Daily visual inspections will also be carried out for the settlement lagoons and their discharge points. Weekly sampling of the outfalls from the settlement lagoons will be carried out.

5.4.3 Temporary Concrete Batching Plant

141. A temporary concrete batching plant will be required on-site, if an adequate supply cannot be guaranteed by local suppliers. Refer to Section 6.4 for more information on the use of concrete.

5.4.4 Construction Compounds

142. Generic mitigation measures for construction compounds are provided in Section 6.1. These are sufficient to avoid likely significant effects at all construction compounds and pipe storage depots therefore no additional, specific measures are required for these activities. In addition, the compound has been located to the western edge of the field to avoid proximity to the Camcor_030 which skirts the eastern and northern boundaries of the field. The Camcor_030 is subject to localised flooding in this area, close to the waterbody bank and locating the compound to the west avoids the potential for inundation during a flood event.

5.5 Flow Control Valve

5.5.1 Construction Sequencing (ID W-SC34)

143. The FCV is a much smaller construction site compared with other infrastructure sites. There is no permanent above ground buildings required. Therefore, the main construction activity will be excavating and installing the below ground valves. Other construction activities will include landscaping, an access road and internal circulation roads, car parks and walkways, security fencing, mechanical and electrical (M&E) plant, instrumentation and control systems, and building services. In addition, a new mains supply will be provided off the electrical grid, to power the plant and equipment.

144. The principal construction materials for the FCV will include reinforced concrete poured in situ, structural steelwork, building work, and above and below ground steel pipework.

5.5.2 Managing Silty Water (ID W-SC35)

145. Drainage from the FCV site paved areas has been designed to incorporate SuDS principles to limit discharges from the site.

146. The appointed Contractor will construct temporary drainage measures to minimise risk of pollution during earthworks construction and other elements of work. This will include the construction of soakaway chambers and filter drains to disperse surface water in a controlled manner. The proposed site layout will include a soakaway at the north-west of the site, which has been sized with a capacity of 52m³.

5.6 Termination Point Reservoir

5.6.1 Construction Sequencing (ID W-SC36)

147. The TPR will be constructed in the sequence outlined in Table 5.5.

Table 5.5: Sequence of Construction Activity - TPR

Sequence	Construction Activity
1.	Site preparation works
2	Topsoil stripping.
3	Excavation for Emergency Overflow Storage Tank, and earthworks to formation of TPR
4	Construction of Emergency Overflow Storage Tank and installation of pipework
5	Construction of TPR and installation of pipework.
6	Construction of Chlorine Control Building
7	Connection to electricity supply and connections to existing pipework
8	Site works, landscaping and boundary treatment

5.6.2 Managing Silty Water (ID W-SC37)

148. At the outset, the appointed Contractor will stone-out future permeable surfaces on a permeable geotextile membrane to provide a working platform. This will minimise surface water runoff during construction.

149. Surface water runoff from a catchment covering the north of the TPR site will be conveyed to an attenuation basin in the north-west corner of the site. Surface Water runoff entering the attenuation basin will be pre-treated in a Class 2 By-Pass Hydrocarbon Interceptor. The outfall from the attenuation basin will be fitted with a penstock which can be used to isolate the attenuation basin to contain pollutants in the event of an accidental spillage.

150. A flow control device on the outlet of the attenuation basin will limit discharge to an equivalent green field runoff from this catchment. This flow will be conveyed to a ditch to the north-west of the site.
151. Surface water runoff from a catchment covering the south of the TPR site and the access road will be conveyed to an attenuation basin in the south-west corner of the site. This attenuation basin will be installed at the outset and used to control silty water from runoff and dewatering. A flow control device on the outlet of the attenuation basin will limit discharge to an equivalent green field runoff from this catchment. This flow will be conveyed to a ditch along the west of the site.
152. Where topography does not allow the free flowing of surface water towards the attenuation basins, the appointed Contractor will construct temporary drainage measures to minimise risk of pollution during earthworks construction and other elements of work. This will include the construction of soakaway chambers and filter drains to disperse surface water in a controlled manner.
153. The volume of the attenuation basins has been designed to accommodate flows from a 1 in 100-year storm event plus a 30% uplift for climate change. These volumes have been calculated as 675m³ for the detention basin located to the south-west of the site and 795m³ for the detention basin located to the north-west of the site

5.6.3 Construction Compounds

154. Generic mitigation measures for construction compounds are provided in Section 6.1. These are sufficient to avoid likely significant effects at all construction compounds and pipe storage depots therefore no additional, specific measures are required for these activities.

5.7 Proposed 38 kV Uprate Works (ID W-SC38)

155. The Proposed 38 kV Uprate Works will be completed by ESBN on behalf of Uisce Éireann. During the Construction Phase, ESBN will be obliged to comply with all the commitments set out in the EIAR and the Natura Impact Statement. In addition, ESBN will be required to comply with any conditions that may be attached by An Coimisiún Pleanála to any planning approval that may be granted for the Proposed Project.
156. In most instances, the 38kV Uprate Works do not involve extensive soil stripping. In addition, access will be across fields and in any peat area or wetland using wide tracked, low ground pressure vehicles to minimise damage to the surrounding ground. No stone access roads are required, where necessary 'bog mats' will be used to cross softer land.
157. Clear span bridging will be used to provide access for construction machinery across watercourses where there is no existing crossing structure. This crossing method will be used unless an alternative crossing method is agreed with IFI. There are seven such crossings required for the Proposed 38 kV Uprate Works.
158. Clear span bridging utilises multiple layers of bog mats, wooden sleepers or lightweight metal structures. The nature of the bridging to be used will be agreed with the Proposed Project ecologist on site prior to installation. IFI have been and will continue to be consulted with respect to watercourse crossings and relevant guidance will be adhered to.
159. Bridging will incorporate silt control fencing to prevent loose material deposition from construction vehicles gaining access to the watercourse being crossed. Clear span bridging will be installed using a tracked excavator, tracked dumper and tracked quad bikes importing materials via the agreed access tracks to the crossing point.

160. There is no requirement to provide temporary crossing infrastructure for the River Shannon or the Headrace. Existing public road crossings of both these significant watercourses will be utilised throughout the works.
161. Trenchless crossings of the Kilmastulla river are required to connect to the RWI&PS and the WTW. Measures will be implemented as described in Section 4.2.1.

6. Generic Control and Mitigation Measures

6.1 Construction Compounds and Pipe Storage Depots

6.1.1 Site Establishment

162. Generally, the Construction Compounds and Pipe Storage Depots will be pervious as they are overlain in stone, which will permit the percolation of surface water through to the underlying subsoil, as happens currently, and to maintain the existing drainage pattern.

- The topsoil, and upper level of subsoil, will be stripped and stockpiled over the works area. Any existing land drains crossing the works area will be culverted
- All watercourses that occur in areas of land that will be used for site compound/storage facilities will be fenced off at a minimum distance of 10m from its banks
- Surface runoff from compounds will be minimised by ensuring that the paved/ impervious area is minimised. Those areas with impervious pavement will be graded to a fuel/oil separator for collection of any surface water runoff contaminants. On greenfield sites, the appointed Contractor will be required to provide a temporary geogrid mattress overlain in stone for trafficking within the Construction Compound
- Direct disposal to the nearby watercourse of arisings from excavations and from groundwater dewatering activities will not be allowed as these could impact both on water quality of the watercourse and increased flood risk. Any discharge of such water, after proper treatment/ de-silting will be discussed and agreed with the landowner and if necessary, discharge consent will be acquired from the regulatory authority prior to the commencement of work
- Other development proposed to occur within the sites includes the laying of interceptor traps in a demarcated area for refuelling, and drainage works associated with plant cleaning and service areas
- Compound locations have been selected outside of lands designated as Flood Zone A or B in accordance with the OPW's The Planning System and Flood Risk Management Guidelines (November 2009).

6.1.2 Security

163. Storage areas will be kept secure to prevent acts of vandalism that could result in leaks or spills.

6.1.3 Drainage

164. Measures below set out how drainage will be managed:

- Generally, the sites will be pervious as they are overlain in stone. Those areas with impervious pavement will be graded to a fuel/oil separator for collection of any surface water runoff contaminants
- Both the bunded refuelling and plant servicing areas will incorporate a forecourt separator for any potential spillages which may occur during vehicle refuelling and road tanker delivery
- The retained contents of the separators will be collected for disposal by a licensed operator to a licensed waste disposal/recovery facility.

6.1.4 Welfare Facilities

165. Measures below set out how welfare facilities will be managed:

- Temporary welfare facilities, including toilets/washrooms/shower facilities and office accommodation will be installed on-site for the duration of the Construction Phase. Provision will also be made for waste collection with segregated skips provided for separate waste types at each compound

- Foul water will be collected and discharged to a storage tank which will be emptied by a suction tanker periodically to the nearest WwTP. There will be no outlet from the storage tank.

6.1.5 Fuel Storage

166. Measures below set out how fuel will be stored and controlled:

- All hydrocarbons used during the Construction Phase will be appropriately handled, stored and disposed of in accordance with recognised standards as laid out by the EPA
- All chemical and fuel filling locations will be contained within signposted, designated bunded areas, a minimum of 10m from any surface water drain or watercourse and 50m from a borehole or well
- For compounds where the site is pervious, an area of hard standing will be installed in a demarcated area for refuelling, and plant cleaning and service areas. This area will be drained via interceptor traps to a soakaway
- Those areas with impervious pavement will also include a fuel/oil separator for the collection of any surface water runoff contaminants at discharge points (for compounds located on impervious carparks, spill kits will include drain stoppers to prevent runoff to drainage gullies)
- The retained contents of the separators will be collected for disposal by a licensed operator to a licensed waste disposal/recovery facility
- Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (for example, chainsaws and jerry cans) including:
 - Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled
 - Spill kits and drip trays will be provided for all equipment and at locations where any liquids are stored and dispensed, and staff will be trained on the procedures to be followed
 - Containers and equipment will be stored on a firm, level surface.
- Procedures and contingency plans will be in place at each work site to address cleaning up small spillages as well as dealing with an emergency incident (see Incident Response Plan (Section 3)). A stock of absorbent materials such as sand, spill granules, absorbent pads and booms will be kept at each work site, on plant working near water and particularly at refuelling areas and where fuel or oil is stored
- When working in or in close proximity to water bodies, an absorbent containment boom will be installed across the watercourse or around the works, securely and closely anchored to the banks or working platform
- The storage of fuels, other hydrocarbons and other chemicals within the construction compounds will be in accordance with relevant legislation and with best practice. In particular:
 - Fuel tanks, drums and mobile bowsers (and any other equipment that contains oil and other fuels) will be housed within a bund of at least 110% capacity of the fuel tank itself or at least 25% of the total volume of the containers, whichever is greatest. The fuel tank will be double skinned. There will be no passive drainage from the bund; any water collected within it will be pumped out and removed off site for disposal.
 - Any designated area or areas for oils, fuel, chemicals, hydraulic fluids, etc. storage and refuelling will be set up at least 10m from any watercourse (or surface water drain) (as per CIRIA guidance) and the storage location within the compound will be organised so as to be as far away from all water bodies as is practicable to minimise risks from leaks and spills.
- Storage areas will be covered, wherever possible, to prevent rainwater filling the bunded areas
- Fuel fill pipes will not extend beyond the bund wall and will have a lockable cap secured with a chain
- Where fuel is delivered through a pipe permanently attached to a tank or bower:

- The pipe will be fitted with a manually operated pump or a valve at the delivery end which closes automatically when not in use
- The pump or valve will be fitted with a lock
- The pipe will be fitted with a lockable valve at the end where it leaves the tank or bowser
- The pipework will pass over and not through bund walls
- Tanks and bunds will be protected from vehicle impact damage
- Tanks will be labelled with contents; capacity information and hazard warnings
- All valves, pumps and trigger guns will be turned off and locked when not in use. All caps on fill pipes will be locked when not in use.

6.1.6 Storage of Materials and Waste

167. Construction compounds will operate a 'just in time' approach to materials deliveries to minimise the amount required to be stored on site. Where material is required to be stored:

- Storage areas will be at least 10m from drains and watercourses
- Storage areas for solid materials, including waste soils, will be designed and managed to prevent deterioration of the materials and their escape (via surface runoff or wind blow)
- Storage areas will be kept secure to prevent acts of vandalism that could result in leaks or spills
- All containers of any size will be correctly labelled indicating their contents and any hazard warning signs.

168. A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and will include as a minimum:

- Valid Materials Safety Data Sheets
- Health & Safety, Environmental controls to be implemented when storing, handling, using and in the event of spillage of materials
- Emergency response procedures/precautions for each material
- The Personal Protective Equipment (PPE) required when using the material.

169. Waste may be stored at construction compounds for a limited amount of time to help to limit the number of vehicle movements to and from site as far as possible to minimise likely significant effects on the local roads. Where waste is required to be stored:

- It will be stored in secure designated areas, in enclosures or containers to prevent material being dispersed by the wind
- Designated areas will be sited at least 10m away from drains and watercourses to limit risk of escape and contamination of watercourses
- Waste storage containers will be labelled with their waste type and their List of Waste code; any labelling will be consistent with Industry Best Practice at the time construction commences and reviewed annually
- Liquid wastes will be stored in containers within bunded zones with secondary containment of at least 110% capacity of the largest container or at least 25% of the total tank capacity inside the bunded zone (whichever is the greatest)
- Incompatible or hazardous wastes will be stored and handled in accordance with Hazardous Wastes Regulations.

6.1.7 Water Supply

170. A service connection will be made to the potable water supply in the public road.

171. No abstraction from local wells or water bodies will be made.

172. Site compounds will be provided with a SuDS designed storage and soak away system² for storm water running directly off site buildings and pavement areas such as access and site roads. Storage compounds will have stoned areas for the clean storage of materials.

6.2 Construction Sequencing

173. In order to protect water bodies from likely significant effects from increased volumes of run-off, silty water and accidental spills, temporary drainage control measures will be installed at the outset, prior to any site clearance works. This will include construction of cut-off ditches; settlement tanks will be set up; and silt fences erected.

174. All works at watercourse crossings will be over-seen by an ecological clerk of works who will ensure all IFI guidance is adhered to.

6.2.1 Dewatering

175. Measures below set out how dewatering will be managed generally:

- All dewatering works will be carried out in accordance with the requirements of CIRIA guidance document C750 Groundwater Control - Design and Practice 2nd Edition (CIRIA 2016)
- An appropriate dewatering system, as approved by the Employer, and groundwater management system specific to the site conditions will be designed and maintained. These will include measures to minimise any surface water inflow into excavations, where possible, and the prolonged exposure of groundwater to the atmosphere will be avoided
- Silt laden runoff and water ingress into excavations will be minimised by:
 - Using techniques such as sheet piles, bored piles or grouting to keep out groundwater
 - Diverting water by digging cut-off ditches (for greenfield sites) or placing sandbags or a small earth bund around the edge of the excavation
 - Where a discharge to a watercourse or local drainage system is necessary, the water will be treated and controlled in accordance with any conditions imposed by regulatory authorities. Silt will be managed through the use of settlement lagoons, silt buster tanks, or a combination as appropriate
 - In accordance with IFI requirements for salmonid waters, suspended solids in any discharge will not be greater than 25mg/l and flows will be controlled to levels appropriate to the receiving water
- Discharge to watercourse of excavation dewatering will be limited to a maximum of 20% of QMED of the receiving watercourse.

² Soakaway Design, BRE Digest 365

6.2.2 Silty Water Runoff

176. Measures below set out how silty water runoff will be managed generally:

- Clearing and topsoil-stripping of each phase of works will be delayed as long as possible, being carried out shortly before construction begins rather than stripping the whole site many months before construction
- Cut-off ditches, berms or diversion channels will be utilised around working area boundaries, where possible, to limit surface water entering the excavated areas and silty water running off the site into surface water features or drains
- Silt fences will be installed/erected along the boundary of water bodies to prevent any silt laden runoff from impermeable surfaces
- Weather conditions will be taken into account by the appointed Contractor when planning construction activities to minimise the risk of silty-water runoff from the site.

6.2.3 Stockpiling of Materials

177. Measures below set out how stockpiles will be managed generally:

- Clearing and topsoil-stripping of each phase of works will be delayed until shortly before construction begins to minimise the duration of stockpiled material
- Where an excavation contains a combination of acceptable and non-acceptable material for re-use the excavation will be conducted so that the acceptable material is excavated and stockpiled separately without contamination by the unacceptable material
- Temporary stockpiles will be located away from drains and watercourses and at a minimum distance of 10m from a non-sensitive watercourse or 50m from a sensitive watercourse
- The topsoil, and upper level of subsoil, will be stripped and stockpiled in identified locations
- For watercourse crossings, stockpiles will not be located anywhere within the crossing working area
- No stockpiles will be located within a European or national site or within a floodplain area
- Management of stockpiles to prevent siltation of watercourse systems through runoff during rainstorms will be required with the final measures to be determined by the appointed Contractor. These will include the following measures or equivalent measures:
 - Allowing the establishment of vegetation on the exposed soil
 - Providing silt fences/ barriers at the toe of the stockpile to mitigate runoff during rain events
 - Surrounding stockpiles with cut-off ditches to contain runoff
 - Directing any runoff to the site drainage system or filter drains along the Construction Working Width and to the settlement pond (or other) treatment systems
 - Providing bunds or another form of diversion to keep runoff from entering the stockpile area.

6.3 Working In or Near Watercourses

178. Buffer strips of natural uncleared vegetation will be preserved between construction activity and all rivers, streams and water bodies being crossed by trenchless excavation. The launch and reception shafts for pipe jacking will be situated outside of the riparian zone, therefore buffer strips of natural uncleared vegetation will be preserved between construction activity and all rivers, streams and water bodies being crossed. This buffer will ensure there is no potential for construction materials to accidentally fall into a water body. The locations for drill rig and the launch and reception shafts will be chosen or engineered as such that the fall is away from the waterbody, thereby facilitating installation of pollution containment and control facilities, in accordance with the 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (IFI 2016). Where feasible, a buffer zone width will be maintained for larger

river channels (>10m) of 35m to 60m and for smaller channels (<10m) of 20m or greater where possible, as per the recommendation in the 'Planning for Watercourses in the Urban Environment A Guideline Developed by Inland Fisheries Ireland' (IFI 2020), or as otherwise agreed with IFI during the construction stage. The same buffers will apply to water bodies paralleled by the proposed pipeline.

- The actual footprint of the construction activity for river crossings will be minimised to less than the 50m wide Construction Working Width, where possible (within the confines of the Construction Working Width)
- Crossings will be constructed as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit
- Water body buffers (extra work area setbacks, refuelling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete
- The natural path of water flow of rivers or streams will not be permanently diverted or blocked
- There will be no temporary or permanent dewatering of rivers or streams downstream of construction sites
- Works within and adjacent to water body will be conducted during forecast low flow periods where possible
- Works within and adjacent to watercourses will be suspended during periods of heavy rainfall (i.e. greater than 10mm/hour or greater than 25mm in a 24-hour period)
- Measures will be taken prior to the onset of winter to prepare construction sites for erosive processes associated with the heavy rainfall to minimise impact on rivers and streams
- In-stream works will not be carried out in water bodies frequented by salmon or trout during the Annual Close Season, and will be undertaken outside of the lamprey spawning season. River and brook lamprey spawn during the period March to April, while sea lamprey spawn during the period May to August. Instream works may be carried out between October and March if juvenile lamprey are translocated; however, the salmonid spawning season will still need to be considered. The duration of the season for salmonids varies regionally. In-stream works will take place under the direction of the Ecological Clerk of Works. The timing of works will be considered on a site-specific basis (typically works can be carried out during the period July to September) and in agreement with the IFI, because some rivers have late spawning salmonids
- All construction machinery operating in-stream will be mechanically sound to avoid leaks of oils, hydraulic fluid, etc. Machinery will be cleaned and checked prior to commencement of in-stream works
- The design and choice of temporary crossing structures will provide for passage of fish and macroinvertebrates, protect important fish habitats, and prevent erosion and sedimentation. Temporary crossings will be installed in accordance with IFI 2016 Guidelines
- The design of the outfalls and settlement ponds and the construction method statements for their installation will be agreed with IFI prior to construction
- The area of disturbance of the watercourse bed and bank will be the minimum required for the installation of the outfall, with the headwall flush with the channel bed and banks
- Any dewatering flows will be directed to the construction drainage system and to the settlement pond (or other) treatment system
- A sediment mat/silt trap or similar will be located immediately downstream of the works within and adjacent to the minor water body. These will be inspected daily, maintained and cleaned regularly during the course of site works. Diversion of water to and from a temporary diversion channel will only take place during the period March to September or as agreed with the IFI
- Small check dams will be constructed in the cut-off water body to trap any sediment, and a sediment trap will be provided immediately downstream of the diversion to the existing water body

- Where in-stream bed material is to be removed, coarse clasts, if present, will be stockpiled at least 10m away from the water body for replacement following channel reinstatement.

6.4 Use of Concrete

179. Measures below set out how the use of concrete will be managed generally:

- The use and management of concrete in or close to watercourses will be carefully controlled to avoid spillage. Alternate construction methods are encouraged for example, use of pre-cast concrete or permanent formwork will reduce the amount of in-situ concreting required
- Weather conditions will be taken into account by the appointed Contractor when planning construction activities which require the use of wet concrete to minimise the risk of the runoff of concrete 'washout' from site
- Where on-site batching is proposed by the appointed Contractor this activity will be carried out at least 10m from watercourses. Washout from such mixing plant will be carried out only in a designated contained impermeable area
- Batching and mixing activities and material storage areas will be located at least 10m (as per CIRIA guidance) away from watercourses and drains
- Chute washout will only be carried out at designated locations, located at least 10m from a surface water drain or watercourse. These locations will be signposted throughout the construction works areas. Chute washout locations will be provided with appropriate designated, contained impermeable area and treatment facilities including adequately sized settlement tanks
- The mixing drum of the plant must be cleaned at the end of each working day, by rinsing the sides of the drum into a "lagoon" where washings are left to "go off". After 7-10 days, the weak concrete residue left behind is broken out and the material can subsequently be used as a general fill under roads and buildings elsewhere on the site
- The clear water from the settlement tanks will be pH corrected prior to discharge to any surface water drain or watercourse
- There will be no hosing of concrete, cement, grout or similar material spills into surface water drains. Such spills will be contained immediately, and runoff prevented from entering the watercourse.

6.5 Vehicles and Plant

6.5.1 Maintenance

180. Measures below set out how vehicles will be maintained to avoid pollution:

- Vehicles and plant provided for use on the site will be in good working order to ensure optimum fuel efficiency, and will be regularly inspected to ensure they are free from leaks and are promptly repaired when not in good working order
- Spill kits will be carried on all vehicles.

6.5.2 Fuels and Refuelling

181. Where the construction works are close to a watercourse (including settlement ponds and attenuation lagoons), and at all watercourse crossings, the following measures will be implemented:

- Fuels, lubricants and hydraulic fluids used for plant/equipment will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment
- All pumps or generators to be placed within drip trays of adequate size and durable construction

- Refuelling of vehicles and plant will be carried out on hard standing, using drip trays to ensure no fuel can contaminate the ground outside of the bunded areas
- Fuelling and lubrication of equipment will not be carried out on-site within 10m of any watercourse, surface water receptor or drainage ditch in accordance with CIRIA guidance
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and a pollution control kit used. The contaminated soil will be removed from the site and properly disposed of to a licensed landfill facility
- Oil booms and oil soakage pads will be kept on-site to deal with any accidental spillage, and replenished immediately once used
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.

182. Prior to in-stream works the appointed Contractor will ensure that all that all construction equipment is mechanically sound to avoid leaks of oil, fuel, hydraulic fluids and grease.

183. All fuels or chemicals kept on the construction site will be stored in protected containers and all refuelling and maintenance will be carried out in bunded containment areas.

6.5.3 Washing

184. Measures below set out how vehicle washing will be managed to prevent pollution:

- The appointed Contractor will provide wheel washing facilities, and any other necessary measures to remove mud and organic material from vehicles exiting the works areas. These will be located at least 10m away from a watercourse
- The cleaning of delivery trucks (with the exception of concrete delivery trucks) will be carried out at the material storage compound and will not be undertaken at the works areas
- The surface run-off from vehicle washing areas will be directed to an on-site treatment system; this also increases the potential for reusing the water. Such a treatment system will typically include:
 - settlement lagoons to remove suspended solids such as mud and silt
 - catchpots or silt traps on drains, and ensure that they are in place during cleaning and emptied at regular intervals
 - removal of oil, grease, petrol and diesel from wash water by passing it slowly through an appropriately sized oil separator.
- The use of detergents in the cleaning process will be minimised; where required, biodegradable and phosphate-free detergents will be used
- If detergents are used in the washing process, the wash water will not be directed through the oil separator as this will prevent it from working. It will be contained and disposed of off-site using a suitable licensed waste disposal operator, or if a foul or combined sewer is nearby, the surface runoff could be directed to it, with the permission of the sewerage undertaker
- To further minimise water used for washing vehicles, trigger-operated spray guns will be used, with an automatic water supply cut-off
- There will be no discharge of water from the vehicle wash system; in line with biosecurity requirements any water that cannot be reused and any sludge created through the settlement process, will be disposed of to a licensed facility via tanker.

6.5.4 Storage and Movement of Plant

185. Measures below set out how the storage and movement of plant will be managed generally:

- Vehicles and plant will not park near or over drains
- For deliveries and dispensing activities, the appointed Contractor will ensure that:
 - Site-specific procedures are in place for bulk deliveries
 - Delivery points and vehicle routes are clearly marked
 - Emergency procedures are displayed, and a suitably sized spill kit is available at all delivery points, and staff are trained in these procedures and the use of spill kits.

7. Monitoring and Inspections

7.1 Monitoring Regime

186. Water Quality Monitoring will be required prior to, during and, where substantial structures have been installed close to or within a watercourse, or where a watercourse has been altered, post-construction. Prior to construction, monitoring will take place weekly for a period of up to three months to establish a baseline and for up to 12 months after to ensure that design and mitigation measures have been successful to avoid significant effects. The durations of pre- and post-construction monitoring, where required, are specified under Section 4 and 5 which detail specific measures for the construction of the proposed pipeline and principal infrastructure, including through areas of peatland. Pre-construction and during construction monitoring will be the responsibility of the appointed Contractor; post-construction monitoring will be the combined responsibility of the Employer and the appointed Contractor during the contract 'close-out period', the length of which to be agreed as part of the contract.
187. The EM will carry out a visual inspection of surface water treatment measures (ponds, tanks, silt fences, sandbags, etc.) on a daily basis. Indicators that water pollution may have occurred include the following:
- Change in water colour
 - Change in water transparency
 - Increases in the level of silt in the water
 - Oily sheen to water surface
 - Floating detritus, or scums and foams.
188. If hydrocarbons are observed or other water quality parameters are suspected to have been exceeded, discharge from the system will be suspended until the quality of the water is of a standard acceptable for discharge.
189. In addition to daily inspections, the EM will, each week, monitor the discharge from any surface water treatment measures, through sampling, for levels of Total Suspended Solids (TSS). S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988 set a water quality standard for suspended solids at 25mg/l. The EM will also carry out site measurements of temperature, pH and Dissolved Oxygen (DO) and once a month (unless a visual inspection suggests an issue) take samples for hydrocarbon analysis (ethylene, benzene, toluene). Samples will be taken of discharges and at the same locations up and downstream of watercourses in close proximity to the works, or at crossing points where relevant for the duration of the following works:
- Site clearance works, earthworks movements and stockpiling
 - Excavations including those associated with the provision of drainage works
 - Construction works within and adjacent to watercourses.
190. The Construction Phase monitoring results will be compared with those results established in pre-construction monitoring. In the event of an elevation above pre-construction levels, an investigation will be undertaken by the EM and remediation measures will be put in place, as appropriate.
191. This monitoring alerts the EM to any detrimental impacts that construction activities could have on water quality such that appropriate remedial action can be taken as quickly as possible. This will also allow the EM to demonstrate the success of the mitigation and control measures employed.

192. The EM will also be responsible for inspections of the following:

- Wheel wash facilities on a daily basis, to ensure they are operating appropriately to clean the vehicles and prevent transfer onto local roads, which in addition to safety and dust issues could lead to silty water runoff into local roadside ditches or surface water drains and that no discharge to watercourses is taking place
- Monitoring of stockpiles on a daily basis or while being filled or emptied and otherwise
- Concrete operations at or near watercourses will be supervised and designated chute washing out facilities will be inspected on a daily basis
- Site compounds and satellite compounds will be inspected on a weekly basis.

193. Monitoring of peat is covered in Section 4.4.

7.2 Recording and Reporting

194. Inspections will be recorded. In the event that water quality pollution indicators are observed, works will cease, and sampling will immediately be undertaken as described for the weekly monitoring, and an investigation of the potential cause will be undertaken by the appointed Contractor. Where the construction works are identified as the source causing the exceedance, the following details will be recorded (the requirement for this will be included in the Proposed Project SWMP):

- Nature of the impacts and mechanism of pollution
- Details of the activity identified as causing the incident or, in the event no clear pathway still exists, activities capable of causing the incident and an assessment undertaken as to the most likely source
- Details of measures proposed and implemented to ensure that such an incident does not re-occur.

195. This information will be shared with the Employer and the regulators where required. Through monitoring and this open and transparent reporting, there is a much reduced likelihood of a small incident becoming a serious one that may require regulator action; proactively providing this information gives the regulator and the Client comfort that these issues are taken seriously on site and addressed in a professional manner.

8. Operational Phase

196. Specific measures for the operational phase are as follows:

8.1 Operation of Washouts (ID W-SO1)

197. The discharges proposed to water bodies will need to be agreed with the relevant regulatory authorities and carried out in accordance with any conditions imposed in regulatory authorisations. As with the potential discharges during the construction phase, it is anticipated that the levels of contaminants (suspended solids and chlorine) in any discharge will be within limits likely to be set and flows will be controlled to levels appropriate to the receiving water. The discharge limitations set out in Section 4.8.3 for the construction phase would also apply to the operational phase.

8.2 Control of Silt Laden Water at Infrastructure Sites (ID W-SO2)

198. During operation, surface water runoff from impermeable areas at each site will be directed via a petrol interceptor to an on-site attenuation tank/lagoon following the guidance of The SuDS Manual (C753) (Construction Industry Research and Information Association (CIRIA) 2015).

199. The volume of the attenuation basins has been designed to accommodate flows from a 1 in 100-year storm event plus a 30% uplift for climate change in accordance with a High End Future Scenario set out in Flood Risk Management: Climate Change Sectoral Adaptation Plan (OPW 2019).

200. A flow control device on the outlet of the attenuation lagoon/tank will limit discharge to an equivalent green field runoff rate from each site.

8.3 Culverting of Water Bodies (ID W-SO3)

201. For any culverts which continue in operation following the construction phase, the same design measures as set out in Section 4.7 will apply:

- Appropriate design of culvert structures and water body modifications (e.g. realignments) with respect to hydromorphology, and both riparian and aquatic ecology
- Allowance for the appropriate conveyance of water and sediment for a range of flows (including at low flow conditions) this will include formation of a low flow channel within the culvert where applicable
- Where culvert gradient requires, baffles will be included in culvert designs for bed material retention and/or provide resting pools for fish
- Limitation of culvert lengths through design
- Close alignment of the culvert with the existing water feature in terms of proposed gradients
- Roughening of culvert inverts and interiors to help reduce water velocities. Where culverts are greater than 25m in length planting should be utilised at the inlets and outlets to smooth the light transition at these locations
- To monitor the efficacy of the above measures, there will be post-construction appraisal to identify if there are issues that can be investigated and addressed at an early stage.

8.4 New Outfall Discharges (ID W-SO4)

202. Post-construction inspections of outfall locations will be undertaken to monitor the efficacy of the design measures set out in Section 4.5:

- Directing each outfall downstream to minimise impacts to flow patterns

- Provision of appropriate scour protection at the base of the outfall headwall where required
- Directing outfalls away from the banks of a river to minimise any potential risk of erosion (particularly on the opposite bank)
- Minimising the size/extent of the outfall headwall where possible to reduce the potential impact on the banks.

9. References

CIRIA (2015). C753 The SuDS Manual.

CIRIA (2001). C532 Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors.

CIRIA (2006a). C648 Control of Water Pollution from Linear Construction Projects: Technical Guide.

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Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1 Annex B) Soil Management Plan

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1. Soil Management Plan

1.1 Purpose of the Management Plan

1. This Soil Management Plan sets out the means by which topsoil and subsoils will be excavated and sustainably stored during the Construction Phase of the Proposed Project prior to their reinstatement following construction activities.
2. The purpose of this plan is to detail the principles of soil management that will be implemented by the Contractor(s) to protect soils and maintain their quality for future use before being returned to their original location where practicable or reused elsewhere on the Proposed Project.
3. This management plan will be updated by the Contractor(s) and included in future updates of the Construction Environmental Management Plan (CEMP), as appropriate and necessary, prior to commencement of works in accordance with the requirements of the CEMP.
4. The scope of this plan is limited to soils on land which will be reinstated. Topsoil and subsoil which become surplus to land reinstatement requirements will be prioritised for use in other landscaping or engineering applications which promote their retention onsite. The management of these soils for landscaping or engineering applications falls outside the scope of this plan and will be managed in accordance with the Construction Waste and By-product Management Plan (Annex C of the CEMP).
5. In relation to the control and management of soil, the Contractor(s) will establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Chapter 3 of the CEMP.
6. The Contractor(s) will include details in the CEMP on appropriate supervision of soil handling operations by suitably qualified and experienced persons to ensure that soils are handled in accordance with good practice. The Contractor(s)' Environmental Manager shall have overall responsibility for compliance with this plan, including monitoring, auditing and subcontractor communications required. Site managers and supervisors will have responsibilities delegated to them, including supervision of soil management compliance as required.

1.2 Relevant Legislation, Policy and Guidance

7. This Soils Management Plan has been informed by Chapter 10 Geology (Soils, Geology and Hydrogeology) of the Environmental Impact Assessment Report (EIAR), which was prepared in line with the following guidance:
 - Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI 2013)
 - Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority (NRA) 2009).

1.3 Construction Impacts on Soil Resources

8. Construction related activities can have adverse effects on soil properties and soil quality in a number of ways:
 - Accidental spillages or the use of chemicals resulting in the contamination of soil resources
 - The mixing of topsoil and subsoil reducing the overall soil quality
 - Offsite disposal of soils due to the mixing of soil and construction waste or contaminated materials which require treatment before reuse or ultimately even disposed of at landfill

- Over-compaction of the soil through the use of heavy machinery or the storage of construction materials
- The use of impermeable materials to cover soils, effectively sealing it, which can result in detrimental impacts on the soils' biological, chemical and physical properties. In addition, this can result in certain geotechnical parameters being altered such as drainage characteristics and structure
- Deterioration of soil structure by incorrect storage, for example, over-high stockpiles compressing soil structure.

1.4 Soil Management

1.4.1 Preparation

9. Biosecurity risks will be identified in advance of soil stripping via consultation with landowners, and good practice measures put in place as applicable, to reduce the potential for soil-borne disease and pathogen transfer between different areas of agricultural land. This will include segregation of soils and cleaning/disinfection of machinery where appropriate. All plant and equipment used during the Construction Phase will be thoroughly cleaned down using a power washer unit prior to leaving site, to prevent the spread of invasive species. Further detail is provided in the Invasive Species Management Plan (see CEMP, Annex F).
10. The full depth of topsoil will be stripped from areas to be disturbed by construction, such as where Haul Roads, compounds and subsoil stockpiles are to be located, and from areas where topsoil would otherwise be sealed by permanent development (hardstanding and materials placement). This soil will be sustainably reused within the Proposed Project or elsewhere wherever practicable.
11. Topsoil from below any root or crown spread of trees proposed to be retained shall not be removed.
12. Areas where soil stripping is required to be undertaken shall be demarcated and fenced off ahead of any major construction plant, vehicles or machinery entering the works area.
13. Surface water filter drains will be excavated, where required, to act as cut-off drains to deal with surface water from adjacent fields. These will drain towards settlement lagoons and will be sited depending on the adjacent topography and may be located either side of the Construction Working Width.
14. Ensure adequate stockpile storage designation areas are prepared prior to soil stripping. Where practicable, stockpiles shall be placed to screen the construction works from receptors sensitive to noise and visual impact, for example residential areas.

1.4.2 Soil Stripping

15. The following general principles will be followed during the stripping and handling of soil across all parts of the Proposed Project.
16. The site shall be carefully examined for non-vegetative potentially hazardous debris (for example, glass, bricks, concrete) and any invasive species, prior to soil stripping, with any such material encountered removed.

17. Areas to be stripped of agricultural soil shall first be cleared of all grass and herbaceous vegetation using mechanical means as agreed with landowners. Special measures shall be employed for removal and translocation of areas of vegetated topsoil (known as turves) containing rare/protected flora (see biodiversity measure B4 in Annex G of the CEMP). Landowners/parties with interest in land shall be given sufficient advance notice of works to harvest crops ahead of construction works commencing; if any crops remain at the start of construction, these shall be cleared by the earthworks contractor. Vegetation will be stored in a stockpile, disposed of, recycled as green waste or harvested (if agricultural crops present). Vegetation shall not be incorporated into soil to be stored.
18. Topsoil will be stripped across the required site area to its full depth, as determined by the Agronomist engaged by Uisce Éireann, and records will be kept of the depths stripped in each of the parcels of land. Uisce Éireann LLOs (Land Liaison Officers) will be present on-site to monitor the stripping, handling, and storage of topsoil, and to record land use details for each affected holding. Topsoil typically has a depth of between 150mm and 400mm across the Construction Compounds and Pipe Storage Depots depending on the rooting depth of the plants growing there. The upper level of subsoil, typically 300mm to 400mm in depth, will also be stripped across the site area.
19. Topsoil and subsoil will only be handled or trafficked when the surface is free of standing water and not frozen. Soils will only be handled when they are in a reasonably dry and friable state, below the plastic limit.
20. Earthmoving plant appropriate to the size of the site and the volume of soil to be stripped will be used in accordance with appropriate work practices. Excavators and dozers shall be used for the majority of soil stripping for the Proposed Project.
21. Approximately 30% of the pipeline route is through areas of peaty soil. In such locations, the peat will be excavated and stored adjacent to the excavation for subsequent reuse. It will be particularly important to only undertake works in suitable weather conditions and to keep the pipeline excavation open for the shortest period practicable. EIAR Appendix A5.3 (Methods of Working in Peat) describes the various proposed techniques involved in working these areas based on the depths of peat that might be expected.
22. Detailed records will be kept of soil stripping operations undertaken to ensure that soils are used for their intended purpose or reinstated to the correct agricultural field as applicable.

1.4.3 Soil Storage

1.4.3.1 Stockpile Construction

23. The main aim when temporarily storing soil in stockpiles is to maintain soil quality and to reduce the potential for damage to the soil's physical condition and structure, and to facilitate the re-spreading and reinstatement of soil material. In addition, stockpiling soil shall be done in a way that does not cause soil erosion, pollution to watercourses or increase flooding risk to the surrounding area.
24. Topsoil and subsoil will not be mixed and will be stored in separate stockpiles positioned within designated areas and kept free from the passage of vehicles and plant.
25. The topsoil and top layer of subsoil stockpiles will be located away from drains and watercourses. The location of stockpiles will follow the guidelines outlined in the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland 2016). See CEMP Annex A (Surface Water Management Plan) for further information.
26. Soil will be transported directly to its stockpile location after stripping, and once the stockpile has been formed, the soil will remain in the stockpile until it is reused at its final destination. Interim stockpiles will not be used, unless unavoidable, to reduce double-handling of soils.

27. In order to minimise the effect of storage:

- Stockpiles will be built neatly and well-shaped with a slope no greater than 1:2 to ensure, as far as practicable, they are weatherproof
- A minimum separation distance of at least 1m will be kept between heaps of topsoil and subsoil to prevent cross contamination
- Stockpile heights will be a maximum of 2m
- Stockpiles shall be shaped in a manner that facilitates the shedding of water and avoids the potential for ponding
- Stockpiles will be monitored for signs of ponding, as indicated by standing water, and erosion. Where it occurs, temporary drainage measures, regrading and/or silt fencing will be put in place
- Be located to avoid interference with rainwater runoff from adjacent areas, and to prevent the pollution of water bodies
- Be located beyond tree canopies and identified root protection zones around trees and vegetation to be retained
- Be located in an area of the site where stockpiles can be left undisturbed and will not interfere with site operations.

28. In areas of peatland, the following differences should be noted compared to non-peat areas:

- Some areas of peat will not require topsoil stripping and so construction working areas that would usually be used for topsoil storage can be used for storage of layers of peat material, widened excavation and additional drainage, where required. Note that some areas of peatland do have topsoil, notably where grassland overlies peat in agricultural areas
- During the construction of the pipeline the peat will be stored in separate layers, kept wetted and reinstated in the same order that it was extracted. Specifically, where an 'acrotelm' layer of peat exists, it will be stripped and temporarily stored separate to other excavated peat.

1.4.3.2 Management of Stockpiles

29. Once the stockpile has been completed the area shall be clearly defined to prevent any disturbance or contamination by other construction activities. Wheeled vehicles will be prohibited from tracking over stockpiles of soil that are to be reused.

30. In order to mitigate the adverse effects of soil storage, sites will be managed in such a way that soil storage periods are minimised in duration.

31. Should stockpile durations be greater than six months, the application of a mix of grass and other seeds to the stockpile surface will be implemented to aid in reducing potential surface erosion and prevent potential nuisance weed infestation. Any weeds that have established on the stockpiles will be managed by cutting techniques such as mowing and strimming to prevent seed dispersion.

32. Where the stockpiles are left unvegetated, they shall be sprayed with water as necessary to prevent dust generation.

1.4.4 Soil Restoration

1.4.4.1 Reuse and Restoration of Soils

33. Where land is to be reinstated to its former use, such as for agriculture, soils will be reinstated to their pre-disturbance depths and quality as far as practicable.

34. Areas where soils are to be restored shall be protected from the in-flow of water and ponding. In locations where ponding has occurred due to inclement weather, these areas will be drained in advance of restoration and allowed to dry out.
35. Restoration operations shall be undertaken in line with a restoration plan, with soil units defined on site with information to distinguish types, layers and thickness.
36. All surfaces to receive topsoil or subsoil will be inspected and all obstacles, such as wire, rope, wood, metal, plastic and concrete debris, and any temporary roads, surfacing or building materials, removed from site before the soils are reinstated.
37. Appropriate cultivation and decompaction measures will be undertaken during reinstatement for topsoils, subsoils, and their receiving substrates, including loosening with ripping equipment.
38. Reinstatement through areas of peatland will be undertaken in line with EIAR Appendix A5.3 Methods of Working in Peat. Reinstatement will be undertaken on a 'like for like' basis with the excavated peat used to backfill the excavation around the pipeline in approximately the same layers and depths that it was excavated from. Hydraulic connectivity will be reinstated over the top of the pipe, where it existed prior to construction and this will include reinstating permanent drainage and drain blocks over the top of the pipe in order to reinstate the drainage back to the condition that existed pre-construction.

1.4.4.2 Substrate

39. The substrate shall be properly de-compacted to break up any panning or sealing of the ground surface, in order to reduce flood risk and to promote deeper root growth.
40. The remediation of the subsoil will be undertaken by scarifying/ripping it with tractor mounted flat lift rippers to a minimum uniform depth of 600mm, taking care not to damage the field drainage and other services. The depth of ripping will be selected to scarify/loosen any material compacted during construction. In all cases the depth of ripping shall exceed the depth of subsoil compaction. All surface stones and roots over 150mm in diameter will be picked up and removed from the subsoil.
41. The spreading of subsoil (and later topsoil) will be carried out during favourable weather conditions when the soil is drier and more friable. The subsoil stockpiled for reinstatement will be pushed evenly across the site area using excavators (with tractor shovels) and graders to leave it generally level. Then, the separately stockpiled topsoil will be similarly spread to present a neat and level appearance.
42. The spreading of subsoil will be undertaken from the furthest point from the area access point, to avoid over-compaction of already placed subsoil. Spreading will be undertaken to an agreed thickness with subsequent layers applied, as required.
43. Subsoil placement works shall be suspended if sustained heavy rain occurs during the soil handling operations, and not restarted until the ground has had at least a full dry day or agreed moisture content criteria can be met.

1.4.4.3 Topsoil

44. The Contractor(s) shall endeavour to reuse soils as soon as is reasonably practicable and return topsoil stripped during the construction as close to its source of origin as reasonably practicable, and appropriate to the design, during restoration.
45. The application of topsoil to each designated area will be by excavation from temporary storage stockpiles and spread evenly across the sites as described above. The spreading operations will commence at the furthest location from the access point and work backwards to avoid tracking over newly placed topsoil.

46. The topsoil will be spread to an agreed depth as per the landscape specification for Proposed Project.
47. Topsoil placement works shall be suspended if sustained heavy rainfall occurs during the soil handling operations, and not restarted until the ground has had at least a full dry day or agreed moisture content criteria can be met.

1.5 References

Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.

Institute of Geologists Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

National Roads Authority (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1 Annex C) Construction Waste and By-Product Management Plan

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1. Construction Waste and By-Product Management Plan

1.1 Introduction

1. This document is the Construction Waste and By-Product Management Plan (CWBPMP) for the Construction Phase of the Proposed Project. It forms part of the Construction Environmental Management Plan (CEMP) and should be read in conjunction with the CEMP. This CWBPMP covers the management of all Construction Phase waste and/or by-products which are likely to be generated as a result of the construction activities undertaken for the Proposed Project.
2. This CWBPMP outlines the minimum requirements for the management of waste and by-products arising as a result of the Construction Phase of the Proposed Project. This CWBPMP shall act as a guide for the appointed Contractor who will be responsible for preparing their own site specific CWBPMP(s) for the Proposed Project.

1.2 Legislation and Guidance

3. The purpose of this CWBPMP is to provide the information necessary to ensure that construction waste is managed in accordance with current legal and best practice requirements. The following is a non-exhaustive list of applicable waste management legislation:
 - Waste Framework Directive (2008/98/EC)
 - Revised Waste Framework Directive (2018/851)
 - Waste Electrical and Electronic Equipment Directive (2002/96/EC) (As amended by Directive 2012/19/EU and Directive (EU) 2024/884)
 - Waste Incineration Directive (2000/76/EC)
 - Landfill Directive (1999/31/EC)
 - Integrated Pollution Prevention and Control Directive (96/61/EC)
 - Packaging and Packaging Waste Directive (94/62/EC)
 - Hazardous Waste Directive (91/689/EEC)
 - Circular Economy and Miscellaneous Provisions Act 2022 (No. 26 of 2022)
 - Waste Management Act 1996 (No. 10 of 1996) as amended. Subordinate legislation includes:
 - European Communities (Waste Directive) Regulations 2011 (S.I. 126 of 2011)
 - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended (2008, 2015, 2016, 2023)
 - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007) as amended (by S.I. No. 250 of 2019)
 - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended (by S.I. No. 350 of 2010)
 - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
 - Waste Management (Permit) Regulations 1998 (S.I. No. 165 of 1998)
 - Waste Management (Waste Electrical and Electronic Equipment) Regulations 2005 (S.I. No. 340 of 2005) as amended (by S.I. No. 375 of 2008)
 - Waste Management (Landfill Levy) (Amendment) Regulations 2024 (S.I. 442 of 2024)
 - Waste Management (Tyres and Waste Types) Regulations 2007 (S.I. No. 664 of 2007) as amended (2017, 2018)

- Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. No. 113 of 2008)
 - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. 149 of 2014)
 - European Union (Batteries and Accumulators) Regulations 2014 (S.I. 283 of 2014)
 - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009)
 - Waste Management (Food Waste) (Amendment) Regulations 2024 (S.I. No. 294/2024)
 - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. 430 of 2015)
 - European Union (Household Food Waste and Bio-waste) (Amendment) Regulations 2023 (S.I. 679 of 2023)
 - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended (by S.I. No. 73 of 2000)
 - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended
 - Waste Management (Movement of Hazardous Waste) Regulations 1998 (S.I. No. 147 of 1998)
 - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994)
 - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended (by S.I. No. 383/2018)
 - European Union (Waste Directive) Regulations 2020 (S.I. No. 323 of 2020)
 - European Union (Industrial Emissions) Regulations 2013, (S.I. No. 138 of 2013) as amended (by S.I. No. 446 of 2024).
- Environmental Protection Agency Act 1992 (No. 7 of 1992) as amended
 - Litter Pollution Act 1997 (No. 12 of 1997)
 - Planning and Development Act 2000 (No. 30 of 2000) as amended
 - Protection of the Environment Act 2003 (No. 27 of 2003).
4. This CWBPMP has been prepared in accordance with the following guidance and policy documents:
- The Management of Waste from National Road Construction Projects, GE-ENV-01101 (Transport Infrastructure Ireland 2017)
 - Guidance on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011 (Environmental Protection Agency (EPA) 2019a)
 - Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA 2021a)
 - Waste Classification – List of Waste and Determining if Waste is Hazardous or Non-Hazardous (EPA 2019b)
 - A new Circular Economy Action Plan For a Cleaner and More Competitive Europe (COM(2020) 98 final) (European Commission (EC) 2020)
 - EU Construction & Demolition Waste Management Protocol (EC 2024a)
 - National Hazardous Waste Management Plan 2021–2027 (EPA 2021b)
 - A Resource Opportunity – Waste Management Policy in Ireland (Department of the Environment, Community and Local Government 2012)
 - A Waste Action Plan for a Circular Economy (Department of Communications, Climate Action and Environment 2020)

- Construction & Demolition Waste: Soil and Stone Recovery/Disposal Capacity – Update Report 2020 (RPS on behalf of Dublin City Council 2020)
- National Waste Management Plan for a Circular Economy 2024-2030 (Regional Waste Management Planning Offices 2024).

2. Waste Management Context

2.1 Waste Management Principles

2.1.1 Waste Management Hierarchy

5. Central to all waste management principles is the need to reduce the amount of waste being generated. The waste management hierarchy shows the different ways of managing waste in order of preference, with the preferred option being to prevent something from becoming a waste in the first place. The waste management hierarchy is reproduced in Diagram 2.1. In accordance with the waste hierarchy, the preference is to prevent a material from becoming a waste in the first place, with the least preferred option being disposal.
6. Based on volume, Construction and Demolition (C&D) waste is the largest waste stream in the European Union (EU) (EU 2024b). Correct management of C&D waste can have major benefits in terms of sustainability, quality of life and major benefits for the construction and recycling industry.

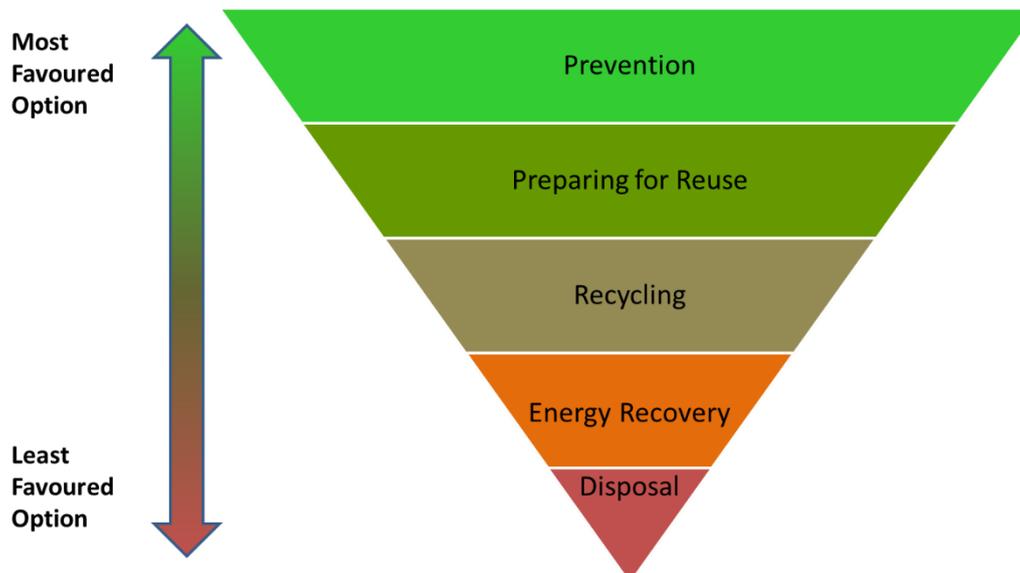


Diagram 2.1: The Waste Hierarchy

7. The appointed Contractor shall adhere to the waste hierarchy, favouring reuse and recycling over disposal for any waste material which cannot be prevented. Only when all other options are impossible or wholly impractical will the option to dispose of the waste material be considered.

2.1.2 Circular Economy

8. The circular economy model for the use of resources aims to maintain the value of products and materials for as long as possible. Under the model, materials or products are used as intended, and at the end of their life they are repaired, refurbished or repurposed into something different and used again. Products at the end of their life are viewed as resources rather than wastes under this model, minimising the amount of waste produced by the economy as a whole. Diagram 2.2 shows a simplified model of the circular economy, showing that the goal is for the bulk of the materials and energy to stay within the circle, with only minimal requirements for new materials or resources to feed in and minimal waste outputs.
9. Correct management of C&D waste and application of circular principals will contribute towards the move to a more circular economy, one of the EU's ambitions within the Circular Economy Action Plan (EC 2020).



Diagram 2.2: Circular Economy (Source: Circular Economy in Europe – Developing the Knowledge Base (European Environment Agency 2016))

2.1.3 Waste Management Legislative Exemptions

10. The Waste Framework Directive¹ sets out the exclusions from the scope of the Directive which includes the following under Article 2(1)(c):

'Uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.'

11. Materials from the Proposed Project which fall within this provision are therefore not subject to the requirements of EU and national waste legislation.

12. Article 27 of the European Communities (Waste Directive) Regulations 2011 allows an economic operator to decide, under certain circumstances, that material is a by-product and not a waste. The following conditions must be met in this case:

- Further use of the substance or object is certain

¹ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

- The substance or object can be used directly without any further processing other than normal industrial practice
 - The substance or object is produced as an integral part of a production
 - Further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.
13. Classification of material as a by-product means that the material is of a type that is not regulated by waste management legislation and therefore is not required to be managed as per that legislation. For such construction projects, site-won asphalt and excavated greenfield soil and stone can be categorised under this exemption provided the material adheres to the conditions stipulated under the National By-Product Criteria and a Regulation 27 registration is submitted to the Local Authority. The economic operator and destination for the material must adhere to all applicable requirements for this exemption to be permitted.

2.2 Waste Management in Ireland

2.2.1 National Context

14. The Regional Waste Management Planning Offices published the National Waste Management Plan for a Circular Economy 2024-2030 in 2024.
15. The plan sets out a framework for the prevention and management of waste in Ireland for the period 2024 to 2030 and seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation. The plan responds to the requirement in A Waste Action Plan for a Circular Economy (Department of Communications, Climate Action and Environment 2020) to include targets for reuse, repair, resource consumption and a reduction in contamination. Seven national targets have been developed as follows:
- Target 1A Residual Municipal Waste - waste destined for landfill or recovery by thermal treatment: 6% reduction in residual municipal solid waste per person by 2030
 - Target 1B Construction Materials – C&D waste generated: 12% reduction in C&D waste by 2030
 - Target 2A Material Compliance Recycling - material compliance in the dry recycling bin: 90% material compliance in the dry recycling bin
 - Target 2B Material Compliance Residual - material compliance in the residual bin: 10% per annum increase in material compliance in the residual bin (90% by end of 2030)
 - Target 3A Reuse of Materials - reuse of materials like clothes or furniture to prevent waste: 20kg per person/year
 - Target 3B Reuse Facilities - provide for reuse at 10 civic amenity sites, minimum: 10 sites for reuse (minimum)
 - Target 4A/B Repair of Materials - develop a roadmap for a repair target and provide one collection scheme for repairable materials in each region and align with repair practitioners. This target will also consider a roadmap for remanufacturing: three collection schemes.
16. EU Member States are required to recover a minimum of 70% of non-hazardous, non-soil-and-stone C&D material by 2020 (EU 2008). According to the EPA, Ireland achieved this in 2016, with 71% of that material recovered during that year (EPA 2018). Table 2.1 gives a breakdown of the quantities of C&D waste which were collected by authorised waste collectors in 2022 (the most recent data available). Of the 8,277,304 tonnes of total C&D waste collected, soil and stones made up 82%.

Table 2.1: C&D Waste Quantities Collected in Ireland in 2022 (Source: EPA Waste Data Release, September 2024)

Waste Materials from C&D Sources	Quantity (tonnes)
Soil and stone	6,739,264
Mixed C&D waste	140,402
Concrete, bricks, tiles and similar	618,371
Metals	314,035
Bituminous mixtures	99,099
Segregated wood, glass and plastic	54,131
Waste treatment residues	312,002
Total	8,277,304

17. The number of operational landfills in Ireland has decreased dramatically over the last number of decades, with only three currently in operation, down from 28 in 2010 (EPA 2022). Ireland’s capacity for the management of waste is becoming increasingly constrained, and therefore efficient management of waste arising from large-scale construction projects such as the Proposed Project is very important to manage the potential for such constraints impacting on the Proposed Project.

2.2.2 Regional Context

18. The Proposed Project spans two former waste management regions, namely the Eastern-Midlands Region² and the Southern Region³. Both regions had published Waste Management Plans. These regional plans have been replaced by the National Waste Management Plan for a Circular Economy 2024-2030 (Regional Waste Management Planning Offices 2024).

19. Volume II of the National Waste Management Plan for a Circular Economy 2024-2030 sets out a variety of waste management policies (core policies) for all regions in Ireland. These include the following relevant policies:

- Core Policy 1 (CP1) Protection of the Environment: Oversee waste activities and litter control measures to ensure they do not pose a risk to the environment and human health and make a positive contribution to circularity
- Core Policy 2 (CP2) Climate Action: Support the delivery of the measures and actions prescribed in the Climate Action Plan to contribute to achieving the national climate targets
- Core Policy 3 (CP3) Policy and Legislation: Implement and enforce EU and national waste policies and plans and translate into actions that enable the transition to a circular economy and the achievement of national recycling targets (this includes general EU policy such as the waste hierarchy and more specific policy and targets).

² The Eastern-Midlands Region comprises Dublin City Council, Dún Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow County Councils. While the Eastern-Midlands Waste Management Planning Region is no longer active in 2025, it represents a proportionate area based on the geographic extent of the Proposed Project.

³ The Southern Region comprises the Carlow, Clare, Cork County, Cork City, Limerick City & County, Kerry, Kilkenny, Tipperary, Waterford City & County and Wexford County Councils. While the Southern Waste Management Planning Region is no longer active in 2025, it represents a proportionate area based on the geographic extent of the Proposed Project.

20. The Plan further identifies C&D waste as a 'material stream focus area', with the following targeted policies:

- Targeted Policy 8.1 (TP8.1): Prioritise waste prevention and circularity in the construction and demolition sector to reduce the resources that need to be captured as waste
- Targeted Policy 8.2 (TP8.2): Identify and promote the growth of secondary material markets, including the elimination of barriers to the development of these markets, within the construction and demolition sector
- Targeted Policy (TP8.3): Incorporation of the EPA Best Practice Guidelines for the preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA 2021a) and National Parks and Wildlife Service Soil & Spoil Action Plan (2023), and monitoring by local authorities of the application of these requirements
- Targeted Policy (TP8.4): Identify and promote materials with a low embodied carbon and high circular potential to maximise use in the construction sector
- Targeted Policy (TP8.5): Pursue and support a targeted levy on virgin materials to encourage the use of secondary raw materials.

3. Targets

3.1 Proposed Targets

Table 3.1: Proposed Targets for the Construction Wastes and By-products

Waste	Waste Types	Target
All Proposed Project Construction Waste	Uncontaminated excavated peat	100% beneficial reuse
	Uncontaminated imported materials (from Temporary Construction Roads)	100% beneficial reuse
	Surplus, clean excavated soil and stone Surplus, clean excavated rock Non-hazardous and inert C&D wastes	Zero tonnes of recoverable waste disposed of to landfill

21. The target of the Proposed Project is for 100% beneficial reuse of uncontaminated excavated peat and imported materials and zero tonnes of recoverable waste to landfill, in line with the circular economy ambitions of Uisce Éireann.
22. Targets are to be confirmed prior to construction and to align with any planning requirements, and the final position is to be reached through reviews and the conclusions of the Environmental Impact Assessment Report.
23. The appointed Contractor will monitor their performance against these targets and report their performance to Uisce Éireann on an annual basis.

4. Construction Waste Management

4.1 Details of Waste to be Generated by the Proposed Project

24. During the Construction Phase of the Proposed Project a number of different types of waste streams will be generated within site compounds and along the Construction Working Width. Table 4.1 lists the likely waste streams to be generated, including their associated List of Waste (LoW) code, formerly referred to as the European Waste Catalogue code.

Table 4.1: Likely Construction Waste from the Proposed Project

Waste Type	LoW Code
Drilling muds and other drilling wastes	01 05 04 – 01 05 99
Waste hydraulic oils	13 01 01* – 13 01 13*
Waste engine, gear and lubricating oils	13 02 04* – 13 02 08*
Wastes of liquid fuels	13 07 01* – 13 07 03*
Packaging (including separately collected municipal packaging waste)	15 01 01 – 15 01 11*
Batteries and accumulators	16 06 01* – 16 06 05
Concrete, bricks, tiles and ceramics	17 01 01 – 17 01 03, 17 01 07
Wood, glass and plastic	17 02 01 – 17 02 04*
Bituminous mixtures, coal tar and tarred products	17 03 01* – 17 03 03*
Metals (including their alloys)	14 04 01 – 14 04 11
Soil (including excavated soil from contaminated sites), stones and dredging spoil	17 05 03* – 17 05 04
Gypsum-based construction material	17 08 01* – 17 08 02
Other C&D wastes	17 09 01* – 17 09 04
Municipal waste arising from construction personnel, site office and canteen facilities	20 01 01 – 20 01 08, 20 01 39, 20 03 01

4.1.1 Potential Non-Hazardous Waste Streams

25. The majority of waste arising during the Construction Phase of the Proposed Project will be non-hazardous, comprised of:

- Excavated soil and stone from the infrastructure sites and the pipeline trench
- Packaging
- Concrete
- Drilling waste
- Pile arisings
- Mixed municipal, recyclables and food waste.

4.1.2 Potential Hazardous Waste Streams

26. There will be small quantities of hazardous material requiring disposal as is common for all large construction products. The hazardous waste streams will be comprised of:

- Plant maintenance waste such as oils, oil-contaminated filters and materials, brake fluids and fuels
- Empty receptacles which contained certain substances, e.g. paint cans, solvents
- Landfilled waste from retired, historic or illegal landfill
- Absorbent materials used to clean up any spillages
- Demolition waste containing asbestos

- Contaminated soil and stone (low potential for this)
- Road surfacing containing coal-tar where old road surfaces are being removed.

4.2 Waste Management Measures

27. The following outlines the requirements for the management of all waste arising during the Construction Phase of the Proposed Project.

4.2.1 Construction Waste Management

28. Table 4.2, Table 4.3 and Table 4.4 identify the estimated quantities of key construction wastes and by-products that are likely to be generated from the Proposed Project.

Table 4.2: Estimated Key Construction Wastes

Waste Type	Total Waste (tonnes)
Inert C&D waste	
Blinding concrete (150 – 300mm)	566
Brick and blockwork	198
Concrete	25,193
Granular material (aggregate)	8,740
Glass	1
Kerbing	31
Mortar	24
Non-hazardous C&D waste	
Geotextiles – ground stabilizing matting	0
Ground anchorage	2,910
Grout (bentonite)	16,406
Hot rolled asphalt	297
Insulation	2
Iron	3,378
Reinforcing steel	6,570
Plastics	29
Portal frames	4,061
Steel piles	0
Steel pipe	3,042
Aluminium	587
Construction worker waste	3,600
Hazardous C&D waste	
Hazardous	734

29. The 70% of estimated excavated soil, stones and rocks assumed to be avoided through Regulation 27 or 28 is summarised in Table 4.3. These figures have been calculated based on 98% of excavated soil, stones and rocks, excluding 2% assumed to be hazardous, and excluding the uncontaminated imported soil and stones for temporary works, which is assumed to be 100% sent for beneficial reuse based on the targets outlined in Table 19.36 of Chapter 19 of the EIAR.

Table 4.3: Estimated Key Construction By-products (avoided under Regulation 27 or Article 28)

Waste Type	Total Waste (tonnes)
Stones and soils	308,803
Rocks	187,278

30. Additionally, based on the proposed targets in Section 3.1, the overall volumes of soil, stones, rocks, peat and C&D waste estimated for beneficial reuse/recovery is summarised in Table 4.4 below. These figures have been calculated based on the targets outlined in Table 19.36 and the assumptions for residual effects based on mitigation set out in Table 19.37 of Chapter 19 of the EIAR.

Table 4.4: Estimated Key Construction By-Products (all waste streams)

Waste Type	Total Waste (tonnes)	Basis for Estimation
Stones and soils	1,326,871	100% of 98% of uncontaminated imported material waste to be sent for beneficial reuse, plus 70% of soil and stone waste avoided via Regulation 27 or Article 28 (of the 98% non-hazardous excavated material), plus the remaining 30% sent for recovery
Rocks	267,540	70% of rock waste avoided by Regulation 27 or Article 28 (of the 98% non-hazardous excavated material), plus the remaining 30% sent for recovery.
Peat	225,204	98% non-hazardous peat, of which 100% is sent for beneficial reuse.
C&D waste	59,227	100% of recoverable C&D waste recycled or recovered.

31. The exact quantities of materials excavated and needed in construction are likely to vary to some extent from current estimates as a result of factors that could include, for example, design refinement during detailed design, construction methodology or the defined flexibility within the design. However, this will not change the likely significance of effects. It will be the responsibility of the appointed Contractor to confirm final estimates of materials excavated and construction wastes generated and use the principles outlined within this draft management plan to ensure appropriate management routes according to the waste hierarchy and the circular economy.

4.2.2 Waste Minimisation

32. The purpose of this CWBPMP is to ensure that waste is managed appropriately and according to requirements and best practice. The best option according to the waste hierarchy as outlined in Section 2.1.1 is the prevention of the waste. The following measures shall be implemented to minimise the amount of waste generated:

- Avoid over-ordering, only ordering items as needed using the 'just-in-time' philosophy for management of materials ordering and delivery
- Ensure that construction materials delivered to the site are of the correct size and type upon receipt to reduce waste from off-specification items. Off-specification items will be rejected or returned to the supplier if they are deemed incorrect
- Ensure adequate storage of materials on-site. Storage areas will be clearly marked out and will be away from areas near site roads or large plant to avoid accidental damage caused by vehicles
- Ensure weather-sensitive items are stored indoors or in covered storage areas to protect them from the elements
- Materials which are not waste and can be reused (e.g. excavated soils) will be correctly and safely stockpiled as outlined in Section 4.2.3

- Non-waste options for material management will be pursued where feasible, i.e. reuse of excavated materials within other areas of the Proposed Project which may have a material deficit, or declaration of suitable soil and stones as a by-product under Regulation 27 of the European Communities (Waste Directive) Regulations 2011, as amended, for use as a resource on other suitable sites or construction projects (including outside of Uisce Éireann infrastructure projects)
- Debris netting will be erected to prevent materials being scattered by the wind
- Waste receptacles such as skips will be secured so as to minimise impact from fly-tipping.

33. Additional actions which will be taken to manage waste arisings in order to minimise impacts include:

- Foul water arising from welfare facilities provided during the Construction Phase will be collected and discharged to a storage tank which will be regularly emptied by a suction tanker to the nearest wastewater treatment plant. There will be no outlet from any of these storage tanks
- A regular programme of site tidying will be established to ensure a safe and orderly site
- 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 will be stored away from any sensitive receptors (e.g. surface waters) and in such a way as to prevent uncontrolled contaminated runoff through bunding or storage in non-permeable areas with adequately controlled drainage installed.

4.2.3 Waste and By-product Storage

34. The number of waste and by-product containers and the location(s) of storage areas will be optimised to make the system user-friendly to site staff using the waste and by-product facilities. Waste must be stored at all times in a manner that is not likely to cause environmental pollution and is easily accessible to waste collection vehicles from the approved suppliers.
35. Wastes and by-products will be stored as close to the place of production within a dedicated and secure waste compound where practicable or stored at a designated and secure storage compound at an off-site location, and in a secure manner at all times in order to prevent the escape of wastes and by-products into the environment that could cause pollution. Spill kits will be provided in all storage locations which can be used in an emergency to prevent the release of wastes to the environment.
36. Where wastes and by-products are produced at temporary Pipe Storage Depots, collections will be co-ordinated in a timely manner to prevent the storage of wastes and by-products at temporary sites which have been closed or are unattended for longer periods of time. In these circumstances, it may be more suitable to transfer waste/by-products to a central storage facility at a Principal Construction Compound.
37. All waste will be stored on impermeable ground and/or within suitable containers which are located away from any watercourse that could be impacted by escaping wastes. Where feasible, all containers will be labelled to identify the contents and to promote good levels of segregation which will maximise recycling rates. Consideration will be given to using standard colour coding on bin labels across the Proposed Project sites, with the addition of pictures/icons.
38. Liquid wastes must be stored on impermeable ground and within suitable tanks or containers that are banded to contain no less than 110% of the volume of the tank/container. The bands must be inspected on a regular basis to ensure the bund is not retaining rainfall.
39. Containers used to store wastes will be in good condition with no holes which may allow wastes to escape to the environment. Containers will also be covered to prevent the escape of windblown waste and dust to the environment.

40. All hazardous waste must be stored in a designated area and different types of hazardous waste will not be mixed within storage. Hazardous wastes will be stored securely, in a manner commensurate to the risk presented by the type and volume of the waste material. Some hazardous wastes may be incompatible with other types of waste and will be physically separated.
41. If asbestos waste is generated from any construction site, then the storage must be carried out in accordance with all regulatory requirements, which includes requirements to store waste securely within appropriate packaging and with appropriate labelling. Where asbestos waste is expected to be generated, suitable storage materials will be in place prior to the commencement of construction work.
42. By-products and materials suitable for reuse will be stored within separate stockpiles away from waste materials for recovery/disposal, to avoid wastes and by-products being mixed. Different classifications of by-products will be stored separately to best implement the waste hierarchy to promote reuse over recycling. Stockpiles of by-products will be clearly labelled so they are identifiable to site staff to prevent the addition of materials that may not be suitable and the incorrect removal of materials for an inappropriate use.
43. Measures will be taken to prevent the generation of nuisances such as odour and dust from waste and by-products that are being stored which may give rise to emissions.
44. Waste will be collected in a timely fashion by approved suppliers so as to prevent overly large volumes of waste accumulating and attracting further wastes or fly-tipping.
45. Good practice waste storage techniques that keep wastes and by-products separate will enable effective recycling and provide higher quality of recycled aggregates and materials.

4.2.4 Management of Waste and By-product Streams

46. The main types of construction wastes and by-products that are likely to be produced by the Proposed Project and potential methods for managing them are detailed below.
47. Excavated soils and stones will require monitoring, assessment and segregation at each site to maximise the potential for reuse as a by-product. Where possible material would be reused and registrations would be submitted to the Local Authority for consideration, or notifications would be submitted to the EPA for determination.
48. If material does not meet the assessment as a by-product but is suitable for recovery/recycling under Article 28 at soil treatment facilities to be classified as a non-waste, excavated materials will be stored within a separate stockpile.
49. If reuse and recovery/recycling are not viable options, then wastes will be segregated for off-site disposal with dedicated stockpiles or suitable containers, depending upon the volumes, located on made ground. Excavated materials identified through testing as containing hazardous materials will be managed as hazardous wastes.
50. Packaging waste may come in many forms and where practicable will be stored separately and returned to the supplier for reuse. Where reuse is not practicable, packaging will be segregated and recycled through dedicated containers or within a mixed plastic packaging container. If packaging has contained hazardous materials, the empty containers will be managed as hazardous waste.
51. Concrete wastes that are uncontaminated will be placed into skips for off-site recycling or disposal as inert wastes.

52. Drilling waste containing bentonite and excavated materials will need to be disposed of as non-hazardous wastes, where applicable, and placed into a separate container for disposal off-site.
53. Pile arisings may be contaminated with other materials and will need to be assessed at each construction site to identify the appropriate waste disposal method where they are unable to be reused.
54. Mixed municipal, recyclables and food waste will be generated via site staff from offices and welfare facilities. Where practicable, the different waste streams will be segregated at source and placed into dedicated, labelled waste containers for mixed municipal waste, mixed recyclables and food waste that are of an appropriate size for the construction site. Collection frequencies will be reviewed during the Construction Phase of each site to ensure it is appropriate.
55. Metal waste is also likely to be produced and is highly recyclable and, depending upon the volumes generated at each construction site, could be segregated into separate skips for ferrous and non-ferrous metals to facilitate a higher quality of recycling. Where only small quantities are generated, this can be mixed within one skip and sent for off-site segregation and recycling.
56. Wood and timber wastes generated from construction activities that are uncontaminated, e.g. wood which has not been contaminated with paints or preservatives, will be segregated and stored within dedicated wood skips.
57. Hazardous wastes can be expected to be generated from a number of sources during the Construction Phase and will need to be segregated, stored and managed appropriately. Likely sources of hazardous wastes include maintenance fuels/oils and containers, batteries, and waste electrical and electronic equipment. These will be stored separately within dedicated and labelled containers prior to off-site recovery, recycling or disposal.
58. Some hazardous excavation materials may also be encountered during the Construction Phase and will need to be assessed by a suitable competent person to identify contaminations and ensure these hazardous materials are segregated from non-hazardous and uncontaminated soils. Additional soil testing may also be required to identify or confirm the absence of any hazardous materials.
59. If asbestos waste is likely to be generated from any construction site, then the storage, transfer and disposal must be carried out by suitably trained and licensed contractors with the correct Waste Collection Permits that allow them to collect asbestos waste.

5. Roles and Responsibilities

5.1 Uisce Éireann

60. Uisce Éireann will develop the detailed project design and associated tender documentation, evaluate Contractors, act as the Employers Representative and oversee the Construction Delivery Partners during the construction and commissioning of the Proposed Project. The Construction Delivery Partners may comprise multiple tiers of contractor appointed to deliver a given works contract, and multiple main design-build contracts are anticipated to deliver different elements of the Proposed Project. Information on the quantities of materials to be excavated and quantities of materials to be used in construction of the Proposed Project will emerge during the design-build process.
61. Uisce Éireann and/or the Employer Representative appointed by Uisce Éireann will be responsible for the overall implementation of this CWBPMP and for meeting the reporting and recording requirements associated with the Proposed Project; and will ensure that resources are in place to support the implementation of the CWBPMP in order to achieve any statutory requirements and additional targets identified by the Proposed Project.
62. Uisce Éireann and/or the Employer Representative appointed by Uisce Éireann will be responsible for approving changes made to the CWBPMP by the appointed Contractor, prior to works commencing, that may have a material impact on the CWBPMP and the ability to meet targets associated with the Proposed Project.

5.2 Appointed Contractor

63. The appointed Contractor will be required to update the current version of this CWBPMP prior to the commencement of the Construction Phase of the Proposed Project. They will update the CWBPMP to produce site specific CWBPMP(s) as the detailed design of the Proposed Project is developed, to provide greater detail and information based on the final estimates of materials excavated and construction wastes generated. The site specific CWBPMP(s) will also include any conditions imposed by An Coimisiún Pleanála as part of the planning permission for the Proposed Project.
64. This information will enable the appointed Contractor to identify the potential use or disposal options available during construction with greater clarity and make use of any new and emerging best practice waste and by-product management techniques.
65. The appointed Contractor will be responsible for day-to-day implementation of the CWBPMP for the duration of the Construction Phase in order to achieve the objectives of the CWBPMP, for managing the day-to-day activities that give rise to wastes and by-products at each of the sites associated with the Proposed Project, and for maintaining the CWBPMP as a live document as more information becomes available.

5.2.1 Waste and By-Products Manager

66. The appointed Contractor will appoint a Waste and By-Product Manager who will be responsible for all aspects of waste and by-product management across all sites during the Construction and Commissioning Phases of the Proposed Project. The Waste and By-Product Manager will be appropriately trained in technical assessment and classifications of the typical wastes and by-products that will be expected to be generated. The Waste and By-Product Manager will be required to communicate with site staff responsible for individual construction sites associated with the Proposed Project and to provide suitable training to staff, contractors and suppliers working at each site.

67. The Waste and By-Product Manager will be responsible for maintaining project records of waste and by-product transfers off-site and ensuring transfers are only completed by contractors who are in possession of a valid permit. These records will include, but are not limited to:
- Details of by-products reused on-site, including volume/quantity of the reuse
 - Details of by-products reused off-site, including volume/quantity and the location of the reuse
 - The names of approved suppliers responsible for completing waste collections and details of the valid Waste Collection Permit held
 - Details of wastes collected, the LoW code, description of the waste, volume/quantity of the waste
 - The names and locations of sites receiving wastes from the Proposed Project and details of the authorisations (permits/certifications) held
 - The names and locations of sites receiving by-products from the Proposed Project and details of the authorisations (permits/certifications) held.
68. The Waste and By-Product Manager will be responsible for classification of excavated soils and stones and for an assessment of the hazardous nature of suspected contaminated soils, including through the use of laboratory testing of sampling. The Waste and By-Product Manager will complete the sampling and testing of excavated materials or be responsible for overseeing the provision of this service by a suitably qualified and competent contractor.

5.2.2 Construction Site Manager

69. Each Construction Compound and Pipe Storage Depot associated with the Proposed Project, will have a nominated Site Manager who will be responsible for day-to-day management of wastes and by-products generated at that site. These responsibilities include the day-to-day housekeeping of the waste storage location that promotes the proper segregation of wastes and by-products, ensuring segregation of different wastes and by-products into the relevant storage labelled containers and taking corrective actions when instances of poor segregation are noted.
70. The Site Manager will be responsible for ensuring the latest version of the CWBPMP is made available for reference by all site staff.
71. The Site Manager will be responsible for the delivery of training to relevant site staff, contractors and suppliers in conjunction with the Wastes and By-Products Manager to enable the implementation of the latest version of the CWBPMP.
72. The Site Manager will be responsible for monitoring and managing the regular and timely collection of wastes, by approved suppliers, so as not to cause environmental pollution, and for the retention of waste records as required by the Waste and By-Products Manager.

5.2.3 Site Staff

73. Site staff working at the construction site associated with the Proposed Project, including temporary construction sites, will complete tasks and work in compliance with the requirements of the CWBPMP in order to prevent waste from being generated, to segregate wastes and by-products to facilitate the separate collection and reuse of by-products (where appropriate), and recycling of wastes (where appropriate) into the correct locations and containers as described in the latest version of the CWBPMP.

74. All staff working at a construction site associated with the Proposed Project will receive waste and by-product management training from the Site Manager (or a nominated deputy) prior to commencing work at the site and updated training, as required. Waste and by-product management training will include information from and the objectives of the latest version of the CWBPMP, waste prevention, waste and by-product segregation requirements, waste storage locations and requirements, by-product storage locations and requirements and any best practice guidelines to be implemented during construction.
75. Site staff will also receive training on the locations and use of spillage kits that are to be deployed in the event of a pollution incident or an event that has the potential to cause pollution.

6. References

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Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1 Annex D) Noise and Vibration Management Plan

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1. Noise and Vibration Management Plan

1.1 Purpose of the Management Plan

1. This Noise and Vibration Management Plan (NVMP) sets out the measures that will be used by the Contractor(s) to manage noise and vibration generated by the construction of the Proposed Project, which can affect residential occupants, users of non-residential noise and vibration sensitive buildings, and sensitive ecological sites and habitats.
2. This NVMP sets out standard, good practice mitigation and monitoring measures. The NVMP will be updated by the Contractor(s) and included in future updates of the Construction Environmental Management Plan (CEMP), as appropriate and necessary, prior to commencement of works in accordance with the requirements of the CEMP. The NVMP will specify the noise and vibration monitoring requirements and reporting that will be undertaken during the construction phase. The NVMP will be divided into site specific measures for each of the major infrastructure sites (i.e. RWI&PS, WTP, BPT, BPS, FCV and TPR) and the pipeline route. Alternatively, separate NVMPs may be prepared for each project element.
3. In relation to the control and management of noise and vibration, the Contractor(s) will establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Chapter 3 of the CEMP.

1.2 Relevant Legislation, Policy and Guidance

4. Guidance:

- British Standard BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise (BSI 2014a) (hereafter referred to as BS 5228-1)
- British Standard BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration (BSI 2014b) (hereafter referred to as BS 5228-2)
- British Standard BS 7385-2:1993 : Evaluation and Measurement of Vibration in Buildings – Guide to Damage Levels from Groundborne Vibration (BSI 1993)
- BS 6472 (2008) Guide to Evaluation of Human Exposure to Vibration in Buildings, Part 1 Vibration Sources Other than Blasting (BSI 2008)
- BS 4142 (2014+A1 2019) Methods for Rating and Assessing Industrial and Commercial Sound (BSI 2014 +A1 2019)
- Transport Infrastructure Ireland (TII) Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (2014).

5. Legislation:

- S.I. No. 549/2018 - European Communities (Environmental Noise) Regulations 2018
- S.I. No. 632/2001 - European Communities (Noise Emission by Equipment For Use Outdoors) Regulations, 2001
- S.I. No. 241/2006 - European Communities (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations 2006.

1.3 Working Hours

6. The Contractor(s) will adhere to standard working hours as far as is reasonably practicable, except in the case of emergency or in respect of exceptions as set out below.

1.3.1 Standard Working Hours

7. The typical working hours during the Construction Phase are:
- 07:00 to 19:00 Monday to Friday
 - 08:00 to 16:30 Saturday
8. The Contractor shall require staff and sub-contractors to adhere to standard working hours along the construction working width and each permanent infrastructure site, unless otherwise agreed and permitted in advance with the relevant Local Authority.

1.3.2 Working Outside of Standard Working Hours

9. As stated in Section 5.2 (Working Hours) of the CEMP, there are activities which may be required to take place outside of standard working hours.
10. Where these activities are planned, the planning of such works will take consideration of noise sensitive receptors (NSL). Consideration will be given to the scheduling of activities in a manner that reflects the location of the site and the nature of neighbouring properties. Each potentially noisy event/activity will be considered on its individual merits and scheduled according to its noise level, proximity to sensitive locations and possible options for noise control. In situations where a particularly noisy activity is scheduled e.g. trenchless crossings and directional drilling or other activities of similar noise level, the use of other on-site activities will be scheduled to control cumulative noise levels.

1.4 Noise and Vibration Limits

11. An assessment of construction noise has been undertaken and is included in Chapter 6 (Noise & Vibration) of the Environmental Impact Assessment Report (EIAR). A detailed list of the construction activities, the plant and equipment for the various construction activities is presented in Appendix A6.3 (Construction Noise Plant Lists) of the EIAR. The maximum permissible limits for construction noise and vibration are presented in the following sections.

1.4.1 Construction Noise (Linear Features)

12. Noise from construction activities associated with linear features of the Proposed Project (pipeline, 38 kV Uprate Works, access roads) will be limited to the values set out in Table 1.1, as far as reasonably practicable. The thresholds in Table 1.1 relate to noise levels at the facades of NSL and are based on TII 2014 Good Practice Guidance (see EIAR Chapter 6: Noise & Vibration for further information on the methodology).

Table 1.1: Maximum Permissible Noise Levels at the Facade of Dwellings during Construction (Linear Features)

Days and Times	Noise Levels (dB re. 2x10 ⁻⁵ Pa)	
	L _{Aeq,1hr}	L _{Amax}
Monday to Friday 07:00hrs to 19:00hrs	70	80
Monday to Friday 19:00hrs to 22:00hrs*	60	65
Saturdays 08:00hrs to 16:30hrs	65	75
Sundays and Bank Holidays 08:00hrs to 16:30hrs*	60	65

Source: Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII 2014)

* Construction activity at these times, other than that required for emergency works, will normally require the agreement of the relevant local authority.

1.4.2 Construction Noise (Infrastructure Sites)

13. Noise from construction activities associated with the permanent infrastructure sites (RWI&PS, WTP, BPT, BPS, FCV and TPR), temporary Construction Compounds and Pipe Storage Depots, and areas where night-time works are scheduled will be limited to the values set out in Table 1.2, as far as reasonably practicable. Category A thresholds have been applied to all NSLs. Therefore, a daytime threshold of 65 decibels (dB) $L_{Aeq,T}$ applies at the nearest NSLs; and evening and night-time thresholds of 55 and 45 dB $L_{Aeq,T}$.
14. The thresholds in Table 1.2 relate to noise levels at the facades of NSL and are based on the ‘ABC’ method set out in BS 5228-1 (see EIAR Chapter 6: Noise & Vibration for further information on the methodology).

Table 1.2: Maximum Permissible Noise Levels at the Facade of Dwellings during Construction (Infrastructure Sites)

Assessment Category and Threshold Value Period (L_{Aeq})	Threshold Value (decibel (dB))		
	Category A	Category B	Category C
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings & Weekends (19:00 – 23:00hrs weekdays) (13:00 - 23:00hrs Saturdays) (07:00 – 23:00hrs Sundays)	55	60	65
Daytime (07:00 – 19:00hrs) and Saturdays (07:00 – 13:00hrs)	65	70	75
Notes	Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values	Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values	Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values

Source: British Standard BS 5228-1 (BSI 2014a)

1.4.3 Vibration

15. Vibration from construction activities will be limited to the values set out in Table 1.3, as far as reasonably practicable, to avoid vibration damage to buildings and structures during construction.

Table 1.3: Recommended Construction Vibration Thresholds for Proposed Project

Allowable Vibration (in terms of PPV) at the Closest Part of Sensitive Property to the Source of Vibration		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8mm/s	12.5mm/s	20mm/s

Source: Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII 2014)

1.5 Mitigation and Control Measures

16. The appointed Contractor(s) undertaking the construction works shall be obliged to take specific noise abatement measures where necessary and comply with the recommendations of BS5228 and the European Communities (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations, 2006. These measures include, but are not limited to, the following:
- The best means practicable, including proper maintenance of plant, will be employed to reduce the noise produced by on-site operations

- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract
- Compressors will be fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools will be fitted with suitable silencers
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.

17. Various mitigation measures will be applied (where appropriate) during the construction of the Proposed Project. Standard, good practice mitigation is set out in the sections below.

1.5.1 Selection of Quiet and Low Vibration Plant

18. The potential for any item of plant to generate noise will be assessed by the Contractor prior to the item being brought onto the site. Wherever practicable, the quietest available plant will be selected to reduce noise emissions. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether or not the item can be replaced with a quieter alternative.
19. For static plant such as compressors and generators used at work areas such as construction site compounds, the units will be supplied with manufacturers' proprietary acoustic enclosures where feasible.
20. The contractor will evaluate the choice of excavation, breaking or other working method taking into account various ground conditions and site constraints. Where practicable and available, alternative lower noise generating equipment that will provide the required structural/excavation/breaking results will be selected to reduce potential disturbance.
21. Measures will be taken to reduce as far as reasonably practicable, vibration due to plant and machinery on the site. In terms of piling and rock breaking, low-vibration methods will be selected over percussive-type piling, where ground conditions permit. This piling method substantially reduces the levels of both noise and vibration generated as it is a non-percussive piling technique.

1.5.2 Noise Control at Source

22. If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control at source. This refers to the modification of an item of plant, the application of improved sound reduction methods in consultation with the supplier, or the good practice use of equipment and materials handling, to reduce noise.
23. The following guidance relates to practical noise control at source techniques which relate to specific site considerations:
- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels are closed during operation can reduce noise levels by up to 10dB
 - Mobile and stationary plant will be switched off when not in use and not left idling (engines, motors, generators etc)
 - For steady continuous noise, such as that generated by diesel engines, it is possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy, to replace the normal engine cover
 - For percussive tools such as pneumatic and excavator mounted breakers, a number of noise control measures will be applied, including fitting muffler or sound reducing equipment to the breaker tool and ensuring any leaks in the air lines are sealed. Erection of localised screens around breaker or drill bits when in operation in close proximity to NSL boundaries are other suitable forms of noise reduction

- For all materials handling, the contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials. This is an important consideration for site compounds where materials are loaded and unloaded
- Construction site compounds in close proximity to NSLs will incorporate a strict noise control policy relating to materials handling. The layout of noisy items of plant within construction site compounds will be considered as appropriate
- Where compressors, generators and pumps are located in areas in close proximity to NSLs and have the potential to exceed noise criteria, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation
- Resonance effects in panel work or cover plates will be reduced through stiffening or application of damping compounds; rattling and grinding noises will be controlled by fixing resilient materials in between the surfaces in contact
- Demountable enclosures will also be used to screen operatives using hand tools (e.g. pneumatic breakers and circular saws) and will be moved along the linear work area as necessary
- All items of plant will be subject to regular maintenance. Such maintenance will prevent unnecessary increases in plant noise and will serve to prolong the effectiveness of noise control measures.

1.5.3 Screening

24. Screening is typically an effective method of reducing the noise level at a NSL location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and NSL.
25. The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen will be wrapped around the noise source.
26. BS 5228–1 (BSI 2014a) states that on level sites the screen should be placed as close as feasible to either the noise source or the NSL. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice, screens constructed of materials with a mass per unit of surface area greater than $\geq 10\text{kg/m}^2$ will give adequate sound insulation performance. As an example, the use of a standard 2.4m high construction site hoarding will provide a sufficient level of noise screening once it is installed at a suitable position between the source and NSL.
27. Annex B of BS 5228–1 (BSI 2014a) (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on site from standard materials. These items will be used at locations where high noise generating activities are occurring in proximity to NSLs. A well placed and designed mobile temporary screen around a breaker or excavation can effectively reduce noise emissions by 10dB(A).
28. In addition, careful planning of the construction site layout will also be considered. Within construction site compounds, the placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening. Site hoarding will be used around all sides of each Construction Compound and Pipe Storage Depot, as well as prominent locations along the Construction Working Width (or where specific mitigation measures are required – see the Register of Environmental Actions and Commitments in Annex G of the CEMP). Similarly, in some instances materials such as topsoil or aggregate can provide a degree of noise screening if placed between the source and the NSL.

1.5.4 Liaison with the Public

29. For the Proposed Project, the major sources of noise are essentially mobile and the noise received at any NSL would therefore vary from day to day as the work proceeds. The duration of excavation, breaking, drilling and other high noise or vibration activities works is usually short in relation to the length of construction work as a whole, and the amount of time spent working near to sensitive areas can represent only a part of the overall period. It is important, therefore, that clear forms of communication are established between the contractor and NSLs in proximity to the works so that residents or building occupants are aware of the likely duration of activities likely to generate higher noise or vibration.
30. Ongoing contact with local residents shall be maintained to ensure any complaints relating to Construction Phase noise for the project from local residents can be addressed. In addition, and prior to any particularly noisy activities, local residents will be contacted in order to reduce the perceived noise impact.
31. A designated noise liaison officer will be appointed by the Contractor(s) during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer.

1.5.5 Control of Vibration

32. The TII Guidelines (2014) recommend that in order to avoid potential for vibration damage during construction, vibration from construction activities should be limited to the values set out in Table 1.3.
33. Specific slope stability control measures will be incorporated into the mitigation design at the Fort Henry Embankment, which will include controlled trials to establish a safe method of working, slope stability monitoring, phasing of works and ongoing risk analysis. These measures will be incorporated into a specific risk management method statement for the embankment and will be embedded into the contract documents.
34. The contractor will evaluate the choice of piling, excavation, breaking or other working method taking into account various ground conditions and site constraints. Where alternative lower noise or vibration generating equipment would be practicable taking account of matters including, for example, ground conditions, equivalent structural / excavation / breaking results, cost and programme, these will be selected to reduce potential disturbance. In practice, a balance may need to be struck between the use of all available techniques and other factors.
35. The decision regarding the type of pile, excavation technique or rock breaking to be used on a site will normally be governed by other engineering, environmental constraints. In these instances, it may not be possible for technical reasons to replace a high noise or vibration process by a quieter / less vibration intrusive alternative. However, even if it is possible, the adoption of a quieter method may prolong the overall process, the net result being that the overall disturbance to the community will not necessarily be reduced. Therefore, a balance will need to be struck between all factors including the duration of the works and the level of likely disturbance.
36. In the case of groundborne vibration giving rise to human disturbance, to reduce such impacts as far as practicable, the following measures will be implemented during the construction period:
 - A pre-construction assessment will be carried out during the detailed design stage to confirm the predicted vibration levels at Vibration Sensitive Locations, as set out in EIAR Chapter 6 (Noise & Vibration), and identify if additional mitigation is required as set out in the following sections
 - A clear communication programme will be established to inform adjacent building occupants in advance of any potential intrusive works which may give rise to levels likely to exceed identified perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars

- Activities capable of generating perceptible groundborne noise and or vibration magnitudes likely to cause adverse significant effects will be restricted to daytime hours only, as far as reasonably practicable
 - Alternative less intensive working methods and/or plant items will be employed, as far as reasonably practicable
 - Appropriate vibration isolation will be applied to plant, as far as reasonably practicable.
37. Construction vibration monitoring will be undertaken where vibration generating activities would occur in close proximity to sensitive properties and the potential for significant effects have been identified.
38. A monitoring strategy with appropriate trigger level limits will be put in place. This will take account of the nature of the works, the duration and the proximity of receptors. In the event of an exceedance, works will be halted, and working methods and /or mitigation measures reviewed alternative work methods identified before works recommence. A trigger level limit for structural effects will generally be set at 8mm/s PPV.
39. For a property identified as being at risk of a structural impact (due to a predicted vibration level above 8mm/s PPV) a structural survey will be undertaken prior to any works commencing. The structural surveys will be undertaken by an independent structural engineer. The surveys will be used to determine whether a building is in any way structurally unsound, inform construction working methods and to identify potential structural damage (including cosmetic damage) resulting from the proposed works.

1.5.5.1 Vibration from Piling

40. For the locations where the potential for significant effects has been identified from piling (that may be required for working in peat), then an alternative construction approach will be considered by the Contractor.
41. The methodology adopted would include, where reasonably practicable to avoid a vibration level above 1mm/s PPV for 10 consecutive days or nights within any 15 consecutive day or night period, measures such as:
- Moving the piling further from the receptors using the construction flexibility set out in Chapter 4 and 5 of the EIAR
 - Reducing the duration of piling below 10 or more days or nights in any 15 consecutive days or night period
 - Adopting press in piling techniques for the installation of the piles. This involves pushing in the piles into the soft ground (peat) and thereby avoiding the generation of vibration.
42. The contractor will be required to demonstrate through a pre-construction assessment that the selected construction technique would not result in a significant effect on receptors.

1.5.5.2 Vibration from Rock Breaking

43. Where rock breaking is proposed by the contractor, a pre-construction assessment will need to be undertaken by the Contractor to confirm that the selected methodology would not result in significant effects at receptors. If this identifies that there would be 10 or more days or nights in any 15 consecutive days or night period of a vibration impact above 1mm/s PPV then an alternative methodology will be considered by the Contractor. This will include consideration of alternative equipment options, such as using a rockwheel trencher (e.g. the Vermeer T655-III Trencher) instead of an excavator-mounted hydraulic breaker.

44. AWN Consulting Ltd has previously conducted vibration measurements under controlled conditions, during trial construction works on a sample site where breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:
 - Three tonne hydraulic breaker on small CAT tracked excavator
 - Six tonne hydraulic breaker on large Liebherr tracked excavator.
45. Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the three tonne breaker ranged from 0.48mms / PPV to 0.25mm/s PPV at distances of 10m to 50m respectively from the breaking activities.
46. In comparison, within the same test, for the same distances (10m to 50m) a six tonne breaker generated 1.49 mm/s PPV to 0.24 mm/s PPV.
47. While these measurements relate to breaking of concrete, the range of values recorded provides some context in relation to typical ranges of vibration reduction that can be achieved for receptors in close proximity to works through the plant selection for the rock breaking activity.
48. The methodology adopted would include, where reasonably practicable to avoid a vibration level above 1mm/s PPV for 10 consecutive days or nights within any 15 consecutive day or night period, measures such as:
 - Moving the rock breaking further from the receptors using the construction flexibility set out in Chapter 4 and 5 of the EIAR
 - Reducing the duration of rock breaking below 10 or more days or nights in any 15 consecutive day or night period
 - Using non-hydraulic rock breaking methods close to sensitive properties. This will include the use of conventional excavators with toothed buckets or 'ripping' tools where practicable
 - Using of lower vibration emitting breakers when working in close proximity to sensitive properties.

1.5.5.3 Vibration from Trenchless Construction Techniques

49. For the proposed trenchless crossing in close proximity to receptors, the Contractor will undertake a pre-construction assessment to demonstrate that measures to reduce the vibration effects have been adopted, where reasonably practicable. Such measures will include the following:
 - Moving the alignment of the trenchless crossing further from the receptors using the construction flexibility set out in Chapter 4 and 5 of the EIAR
 - Reducing the duration of trenchless effects on receptors below 10 or more days or nights in any 15 consecutive day or night period
 - Designing the cutting face of the tunnel boring machine (or equivalent) so that the level of vibration generated at source is reduced.

1.5.6 Monitoring

50. During the Construction Phase, noise and vibration monitoring will be undertaken at the NSLs and vibration sensitive buildings to ensure construction noise and vibration thresholds outlined in Section 1.4 are not exceeded. Noise monitoring will be conducted in accordance with the ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017). The selection of monitoring locations will be based on the nearest NSLs to the working area which will progress along the length of the Proposed Project.
51. Where noise monitoring indicates an exceedance of the applied construction thresholds, the adopted mitigation on-site will be reviewed and improved where feasible.

1.5.7 Construction Phase Specific Mitigation

52. The provision of specific construction mitigation measures is outlined within the following sections for the various elements of the assessment where potential significant effects have been identified pre-mitigation. These measures are included in the Register of Environmental Actions and Commitments (Annex G of the CEMP).

1.5.7.1 Temporary Infrastructure Sites

53. During the Construction Phase of the temporary infrastructure sites, specific mitigation measures are required at Construction Compounds CC6 and Pipe Storage Depots PSD1, PSD3, PSD8, PSD9 and PSD10. General standard mitigation as set out in sections above, including selection of plant with low generation of noise and the situation of noisy plant as far away from sensitive properties as practicable, will be employed as good practice as well as the implementation of site hoarding and screening as outlined within Section 1.5.3.

1.5.7.2 Infrastructure Sites

54. During the Construction Phase of the Proposed Project no specific mitigation measures are required at the RWI&PS, WTP, BPT, BPS and FCV as the assessment presented in Chapter 6 (Noise and Vibration) of the EIAR indicated compliance with the adopted construction thresholds. However, general standard mitigation as set out above, including selection of plant with low generation of noise and the situation of noisy plant as far as practicable from sensitive properties, will be employed as good practice.

55. Regarding the TPR, specific mitigation will be required at this location to mitigate likely significant effects. The nearest NSLs relate to two buildings within Peamount Hospital. Site hoarding of a sufficient height and mass (with regard to the parameters set out in Section 1.5.3) will be erected along the boundary of the hospital alongside localised screening around noisy items of plant and other good practice noise control measures discussed in Section 1.5 to reduce construction noise to within the adopted criteria.

1.5.7.3 Pipeline

56. In relation to the construction of the pipeline, due to the linear nature of these works, attention will be focused on the selection of quiet plant and noise control at source and the implementation of localised screening.

57. Where piling is likely to take place in relation to working methods within peat, one NSL has been identified as being within distances of where a significant effect is likely to occur in the absence of mitigation measures.

58. Specific mitigation will be required at this NSL to mitigate the likely significant effect. Site hoarding of a sufficient height and mass will be erected along the boundary of the construction working width alongside localised screening around noisy items of plant and other good practice noise control measures discussed in Section 5.1 to reduce construction noise to within the adopted criteria.

1.5.7.4 Night-time Works at Trenchless Crossings

59. Noise emissions during the night-time works at trenchless crossings would be reduced by employing the mitigation methods outlined within Section 1.5. Particular attention will be given to the selection of quiet plant (i.e. the use of electric cranes and low noise emission separation pumps) as well as the implementation of screening, monitoring and liaison with the public during the planned night-time works. A clear communication programme relating to the programming of any tunnel works at nearby NSLs will be undertaken at all trenchless crossing sites.

60. Mitigation in the form of further reducing the duration of the works where feasible will be explored.

1.5.7.5 Works at Directional Drilling Locations

61. Mitigation will be needed during the night-time works at directional drilling locations. Noise levels will be reduced by employing the mitigation methods outlined within Section 1.5. Particular attention will be given to localised screening around noisy items of plant as well as the implementation of monitoring and liaison with the public during the planned night-time works.

62. Mitigation in the form of further reducing the duration of the works where feasible will be explored.

1.5.7.6 Road Construction

63. Mitigation will be required to reduce noise levels at the nearest NSLs. This mitigation will include the selection of quiet plant as well as screening where works occur within a distance of 30m from NSLs.

1.5.7.7 Proposed 38 kV Uprate Works

64. Mitigation will be used for NSLs at distances within 30m from the site boundary. The various methods outlined within Section 1.5 will reduce noise levels depending on the degree of mitigation. Due to the linear nature of these works, attention will be focused on the selection of quiet plant and noise control at source.

1.6 References

British Standards Institute (1993). BS 7385-2:1993 : Evaluation and Measurement of Vibration in Buildings – Guide to Damage Levels from Groundborne Vibration.

British Standards Institute (2008). BS 6472 Guide to Evaluation of Human Exposure to Vibration in Buildings, Part 1 Vibration Sources Other than Blasting.

British Standards Institute (2014a). BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise.

British Standards Institute (2014b). BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration.

British Standards Institute (2019). BS 4142 Methods for Rating and Assessing Industrial and Commercial Sound.

International Organization for Standardization (2016). ISO 1996-1:2016 Acoustics - Description, Measurement and Assessment of Environmental Noise - Part 1: Basic Quantities and Assessment Procedures.

International Organization for Standardization (2017). ISO 1996-2:2017 Acoustics - Description, Measurement and Assessment of Environmental Noise - Part 2: Determination of Environmental Noise Levels.

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

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1 Annex E) Dust Management Plan

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1. Dust Management Plan

1.1 Purpose of the Management Plan

1. This Dust Management Plan (DMP) sets out the measures that will be used by the Contractor(s) and sub-contractor(s) to manage dust generated by the construction of the Proposed Project. Dust and emissions from construction plant and vehicles can affect residential occupants, businesses and commercial facilities, users of the road and public rights of way network, users of open space, and sensitive ecological sites and habitats.
2. The construction dust assessment determined the Proposed Project construction would give rise to a high - low risk of dust impacts based on receptor numbers and a large potential for dust emissions depending on the works area involved. It concluded no significant effects based on best practice and appropriate mitigation measures.
3. This DMP will be updated by the Contractor(s) and included in future updates of the Construction Environmental Management Plan (CEMP), as appropriate and necessary, prior to commencement of works in accordance with the requirements of the CEMP. Dust management will be a point of focus at site inductions and regular training and updates are to be provided to all staff working on site.
4. In relation to the control and management of dust, the Contractor(s) will establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Chapter 3 of the CEMP and more details of duties are presented in Table 1.1 of this DMP.
5. These procedures will be monitored and assessed to check they are working satisfactorily. In the unlikely event of dust nuisance occurring outside the site of major works areas or Construction Compounds/Pipe Storage Depots, movements of materials likely to raise dust and dust-generating activities will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.
6. The appointed Contractor(s) will prepare site specific DMPs which will deal specifically with onsite activities to remove or reduce dust emissions associated with the construction works. The site specific DMPs will specify the dust monitoring requirements and reporting that will be carried out so that the effectiveness of the mitigation measures can be assessed. The DMP will be reviewed at regular intervals during the Construction Phase to monitor the procedures in place and to maintain the goal of reducing dust, as far as practicable, through the use of good practice mitigation measures.

1.2 Relevant Legislation, Policy and Guidance

7. Guidance:
 - Guidance on the Assessment of Dust from Demolition and Construction, V2.2, Institute of Air Quality Management (2024)
 - Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, V1.1, Institute of Air Quality Management (2018)
 - Air Quality Assessment of Specified Infrastructure Projects - Overarching Technical Document PE-ENV-01106, Transport Infrastructure Ireland (2022)
 - Good Practice Guide for Construction and Demolition Environmental Management, Dun Laoghaire-Rathdown County Council (2022)
 - Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition, Dublin City Council (2022)

- National Guidelines for the Prevention of Nosocomial Aspergillosis, Health Protection Surveillance Centre (2018).

1.3 Mitigation and Control Measures

8. The full list of dust mitigation measures for high-risk construction sites are taken from Appendix A12.1 (Dust Mitigation Measures) of the EIAR, which details both the generic and site specific measures identified to mitigate the dust impacts from the Proposed Project. The following sections detail the applicable measures for various construction activities across the Proposed Project and site specific measures which will be deployed at the site compound locations.

1.3.1 Communications

9. The following measures shall be employed by the Contractor(s) in relation to communications:
- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site
 - Display the name and contact details of the person accountable for air quality and dust issues on the site boundary
 - Display the head or regional office contact information
 - Develop and implement site specific DMPs, which may include measures to control other emissions, approved by the local authority. The level of detail will depend on the risk and will include as a minimum the recommended measures in this document. The site specific DMPs will include monitoring of dust deposition, dust flux, real-time PM₁₀ continuous monitoring and/or visual inspections, where appropriate.

1.3.1.1 Complaints Procedure

10. The following measures shall be employed by the Contractor(s) in relation to complaints:
- The name and contact details of the person(s) (Environmental Manager and Landowner Liaison Officer [to be appointed by Uisce Éireann]) to contact regarding air quality and dust issues shall be displayed on the Compound boundary hoarding. This notice board will also include head/regional office contact details.
 - A dedicated complaint register will be kept on site detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out. This register will be available for inspection by the local authority, if required.
 - All staff will be briefed on the complaints procedure and the mitigation requirements and their responsibilities to register and escalate complaints received.
 - The following details are to be recorded in the complaints register for all complaints received:
 - Name and address of complainant
 - Time and date complaint was made
 - Date and time of dust issues complained of
 - Characteristics of nuisance, such as soiling of property, visible dust plumes, etc.
 - Likely cause or source of nuisance
 - Weather conditions, such as wind speed and direction
 - Investigative and follow-up actions, including response sent to complainant
 - The following procedure will be carried out for all complaints:
 - Once a complaint has been received it will be recorded in the Compound register of environmental complaints

- The Environmental Manager will then determine the validity of the complaint by undertaking a site inspection / site walkover. The validity of the complaint and any actions taken is to be recorded within the Compound register within 24 hours. This shall include photographs or video of the incident for validation and record keeping
 - For complaints that are deemed valid and the source of the complaint identified, the works will be stopped, the working practices will be revised and additional mitigations put in place to reduce dust emissions
 - The effectiveness of the mitigation measures will be monitored once works continue and if required, further mitigation will be implemented
 - The complainant is to be notified of valid complaints and remedial actions taken as soon as reasonably practicable and within 48 hours
 - All actions are to be recorded in the Compound register of environmental complaints
 - For complaints that are deemed invalid, the complainant is to be notified of the Proposed Projects position as soon as reasonably practicable once the complaint has been investigated
- The register of environmental complaints is to be reviewed by the Environmental Manager on a weekly basis to confirm all complaints have been addressed and review complaints that are reoccurring. Reoccurring complaints indicate that there is a potential failure of dust management and additional mitigation is required
 - Where complaints associated with emission exceedances are found to be valid and have been logged and recorded in the Compound register and remedial actions implemented, the Contractor and Environmental Manager shall notify the client partner¹ Environmental Manager who will then notify the Uisce Éireann Environmental Manager within 24 hours of the emission exceedance. Within 48 hours of the valid complaint being logged, the Uisce Éireann Environmental Manager is to have been notified as to the source of the complaint, the site actions taken and the remedial measures implemented. A record of all complaints incidents received by the Uisce Éireann Environmental Manager is to be kept and reviewed on a weekly basis.

1.3.2 Site Management and Responsibilities

11. The Contractor and sub-contractors must adhere to the measures set out within this DMP. It will be the responsibility of the Contractor to ensure that all staff on site (including sub-contractors and consultants) are trained on the requirements of the DMP and the dust control measures to be used on site. Dust management will be a point of focus at site inductions and regular training and updates are to be provided to all staff working on site.
12. The roles and responsibilities for the Proposed Projects key personnel in relation to dust management are outlined in Table 1.1 below.

¹ The Client Partner are a joint venture of engineering consultants working for Uisce Éireann to progress project's detailed design and to procure and manage construction contractors. Client partner will be confirmed as part of separate appointment process.

Table 1.1: Roles and Responsibilities for Key Personnel

Role	Responsibility
Appointed Contractor	DMP
Contractor Details	[Name and Address to be added on appointment]
Environmental Manager [contact details to be added on appointment]	<ul style="list-style-type: none"> • Ensure work is carried out in accordance with the Dust Management Plan and Construction Environmental Management Plan. • Ensure staff are aware of the requirements of the environmental plans (DMP, CEMP) and procedures. • Ensure that best practice management is implemented and maintained on site. • Undertake subjective and visual monitoring of emissions as part of general site inspections. • Ensure site documents (method statements, risk assessments) include dust mitigation. • Respond to alerts and complaints and maintain the construction complaints log book. • Report on monthly environmental monitoring data and any exceedances in accordance with the parameters set out in this document. • In conjunction with the environment team, provide regular training to the construction work force regarding dust control.
Environmental Specialist [contact details to be added on appointment]	<ul style="list-style-type: none"> • Advise and instruct management team on how to meet legal and contractual dust requirements. • Assist in the implementation and monitoring of this DMP. • Plan, implement and manage the monitoring network. • Carry out compliance checks on monitoring units. • Respond to alerts and assist Environmental Manager with reporting. • Advise on preventative action and mitigation measures that may need to be employed.
Uisce Éireann Landowner Liaison Officer [contact details to be added on appointment]	<ul style="list-style-type: none"> • Act as the first point of contact for the community. • Liaise with the Environmental Manager to report any complaints relating to onsite environmental issues. • Send regular updates at appropriate intervals to all identified affected neighbours/ businesses via a newsletter and post relevant information on the Proposed Project hoarding. Also make the information available via email/website. • Manage and organise community liaison groups.
All Personnel	<ul style="list-style-type: none"> • Carry out the works in accordance with agreed methods and briefings. • Report anything that deviates from agreed processes to site management. • Report all incidents and examples of best practice to section manager. • Attend environmental training and induction.

13. The aim of good site management is to avoid dust becoming airborne at source. This will be done through good design and effective control strategies. The working areas (including compounds) have been designed so that dust generating activities are located away from sensitive receptors in so far as practicable. However, as the construction of the development progresses, the siting of construction activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to reduce the potential for significant dust nuisance.

14. A wind sock shall be erected onsite to aid staff in determining the local wind direction.

15. The dust mitigation measures shall be reviewed at regular intervals during the Construction Phase to confirm the effectiveness of the procedures in place and to maintain the goal of dust reduction through the use of best practice and procedures. While every effort will be made to reduce dust emissions from site activities, should any dust nuisance occur outside the construction works boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are:

- Regular inspections of the working area (including compound) interior and boundary will be carried out to monitor dust. Records and notes on these inspections will be logged in a dedicated on-site logbook

- Regular dust soiling checks of buildings within 100m of site boundary will be regularly carried out (at a minimum weekly). In the abnormal event that the dust control measures fail and significant dust soiling occurs, cleaning will be provided if necessary
 - Where there is a high potential for dust production and the working area (including compound) is active for an extensive period, the working area (including in the compound) or specific operations that have the potential to generate dust will be enclosed by surrounding the activity area on four sides using hoarding, fencing or solid screens to prevent dust escaping
 - A Surface Water Management Plan has been prepared for the project (Annex A of the CEMP) which sets out how site runoff of water or mud will be avoided. The Contractor will review the Surface Water Management Plan in detail and implement the required measures
 - The number of handling operations for materials will be kept to the minimum reasonably practicable. Double-handling of dust generating materials, such as soils, will be avoided. The location of stockpiles is to remain as fixed, unless they are required to be moved for specific activities
 - Site fencing, barriers and scaffolding will be kept clean using wet methods
 - Stockpiles will be covered, seeded or fenced to prevent wind whipping
 - A high level of hygiene will be maintained across the Proposed Project and littering will not be tolerated. Adequate bins will be provided which will be regularly emptied. All waste storage areas are to be regularly cleaned.
16. Good site management will include the ability to respond to adverse weather conditions by either restricting dust-generating operations on-site or using effective control measures quickly before the potential for nuisance occurs.
17. During working hours, technical staff shall be on site and available to monitor dust control methods as appropriate:
- 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 in accordance with the procedure identified in Section 1.3.1.1 of this DMP
 - Make the complaints log available to the local authority when asked
 - Record any exceptional incidents that cause dust and/or air emissions, either on-site or off-site, and the action taken to resolve the situation in the log book in accordance with the procedure identified in Section 1.3.1.1 of this DMP
 - Plan site layout. Machinery and dust causing activities will be located away from receptors where feasible in accordance with Section 1.3.4 of this DMP
 - Site access points have been designed to reduce queuing traffic adjacent to access and egress points as far as practicable
 - Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site
 - Stockpiles and mounds will be kept away from sensitive receptors, watercourses and surface drains, and sited to take into account the predominant wind direction relative to sensitive receptors, where reasonably practicable
 - Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period
 - Remove materials that have a potential to produce dust from site as soon as practicable, unless being re-used on site. If they are being re-used on-site, cover, seed or fence stockpiles to prevent wind whipping
 - Provide showers and enforce a change of shoes and clothes for site staff before going off-site to reduce transport of dust

- Put in place real-time dust and air quality pollutant monitors across the site in locations chosen after consultation with local authorities and check these regularly in accordance with the procedure presented in Section 1.3.6 of this DMP.

1.3.3 Working Hours

18. Standard permitted working hours are:

- Monday to Friday: 07.00 to 19.00
- Saturday: 08.00am to 16.30.

19. The Contractor shall require staff and sub-contractors to adhere to standard working hours along the construction working width and each permanent infrastructure site, unless otherwise agreed and permitted in advance with the relevant local authority.

20. As stated in Section 5.2 (Working Hours) of the CEMP, there are activities which may be required to take place outside of standard working hours.

21. The permitted working hours shall be displayed to the public on the Compound notice board, including any special permissions given for out of hours work.

22. Any special permissions for out of hours work shall be communicated to all identified affected neighbours by the Landowner Liaison Officer (or equivalent officer) identified within a Stakeholder Communications Plan, communications may include a newsletter update issued to affected neighbours and email/website update.

1.3.4 Site Layout

23. Planning of the working area (including compound) layout will be optimised to reduce the environmental impact to nearby sensitive receptors. Sites shall be arranged to maximise the distances between storage areas, points of access and egress, stockpiles and other dust generating activities to the identified sensitive receptors.

- The layout of the working area (including compounds) is designed so that the dust generating activities and machinery will be located so as to take sensitive receptors into account in so far as practicable
- Stockpile heights will be limited to a maximum of 2m
- Site traffic will follow the procedures outlined within the Traffic Management Plan (Appendix A7.2 of the EIAR). Site access points will be designed to reduce queuing traffic adjacent to access and egress points
- Solid screens or barriers will be erected around dust activities or at the working area (including compounds) boundary that are, at least, as high as any stockpiles on site
- Stockpiles and mounds will be kept away from sensitive receptors, watercourses and surface drains where reasonably practicable, and sited to take into account the predominant wind direction relative to sensitive receptors.

1.3.5 Hoarding

24. Prior to any site clearance works hoarding will be erected around all Construction Compounds and Pipe Storage Depots, as well as prominent locations along the Construction Working Width; hoarding is essential for containing construction dust onsite and to act as a barrier to shield sensitive receptors, with particular attention being given to the boundary between the working area and sensitive receptors beyond the boundary.

25. All hoardings will be a minimum of 2.4m in height and fully solid in construction.

26. Site hoarding will be maintained in good condition and regularly inspected.
27. Details of the Compound hoarding on all boundaries shall be provided along with a plan showing its position.

1.3.6 Monitoring

1.3.6.1 Visual Inspections

1.3.6.1.1 Daily Inspections

28. A daily visual inspection will take place if any works are active on the site that day. The visual inspection will be made prior to works commencing, and a yes/no record kept of whether there is a risk of dust emissions that day. In the event that dust emissions are deemed to be a risk that day, additional dust control measures will be on standby in the event they are required. The specific additional measures to be implemented will be dependent on the works to be undertaken.
29. The frequency of visual inspections will be increased to twice per day when activities with a high potential to produce dust are being carried out on site such as during earthworks. The frequency of inspections will also be increased to four times per day during periods of adverse weather, i.e. during periods of dry weather with high wind speeds. The results of these inspections will be recorded in the Compound log book.

1.3.6.1.2 Weekly Inspections

30. Each week an off-site inspection will take place which will consist of a walk around the perimeter of the working areas and compounds and making observations about dust emissions and dust soiling, particularly focusing of locations upwind of on-site activities. Observations will include regular dust soiling checks of surfaces such as fencing, cattle gates, cars and windowsills within 100m of the Compound boundary. Inspection results will be recorded in the Compound log book.

1.3.6.2 Dust Deposition Monitoring

31. Baseline monitoring will be commenced at least three months before the Construction Phase or site-specific activities begin in order to establish an adequate baseline for comparison during the Construction Phase.
32. Monitoring of construction dust deposition at the site boundary during the Construction Phase of the Proposed Project will be undertaken where there are sensitive receptors adjacent to or within 250m of the Planning Application Boundary. This is to check the proposed mitigation measures are working satisfactorily.
33. Monitoring will be carried out using the Bergerhoff method in accordance with the requirements of the German standard VDI 2119 (Verein Deutscher Ingenieure 2013). The Bergerhoff method consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The results of the monitoring will comply with the TA Luft limit value of 350mg/m²/day during the monitoring period of 30 days (+/- 2 days).
34. Dust deposition monitoring will be conducted at relevant locations on site taking into account the location of sensitive receptors and the prevailing wind direction. The number of locations will vary depending on the site layout and activities to allow for all relevant sensitive areas to be captured. The monitoring locations will be selected by an environmental monitoring specialist based on the site specific conditions. A layout plan showing the monitoring locations will be included within this document once locations are finalised.

35. The monthly dust deposition monitoring results will be reviewed by the Environmental Specialist and Environmental Manager. Any exceedances of threshold or limit values is to be recorded in the Compound log book. A suitably qualified and experienced person will investigate, as quickly as reasonably practicable, activities on-site that cause exceedances of limit values recorded by the real time monitoring for dust to ascertain if any visible dust is emanating from the Compound or if any activities are occurring on-site that are not in line with the dust control measures.
36. The results of this are to be recorded in the Compound log book along with any actions taken to remediate high dust emissions.

1.3.6.3 Particulate Matter Monitoring

37. In specific circumstances, in addition to the dust deposition monitoring, real-time particulate matter monitoring for PM₁₀ and PM_{2.5} will be undertaken. This is in areas where there are highly sensitive receptors such as hospitals - such as the Termination Point Reservoir construction compound location, which the Peamount Hospital site is directly adjacent to (less than 10m) - and Drummond Compound. This monitor has the capability to provide alerts if particulate concentrations are elevated above set trigger levels.
38. The particulate matter monitoring will focus on concentrations of PM₁₀ and PM_{2.5} which are a concern in relation to human health.
39. Real-time monitoring for particulate matter can be carried out by means of an OSIRIS light scattering sampler or similar. The Osiris instrument is a light scattering device capable of continuous measurement of PM₁₀, and PM_{2.5}. The air sample is continuously drawn into the instrument by a pump through a heated inlet at a flow rate of 600 ml/min. The incoming air passes through a laser beam in a photometer. The light scattered by the individual particles of dust is measured by the photometer and this information used to measure the size and concentration of the dust particles. The real-time data is recorded on a web-based platform.
40. The real-time monitoring data will be reviewed at regular intervals by the Environmental Specialist, at a minimum four times daily. Alert trigger levels will be established to provide a warning system when dust emissions become elevated. This will include an email/text alert to the relevant personnel (Environmental Specialist / Environmental Manager).
41. When an alert is issued the real-time data will be reviewed by the Environmental Specialist. An investigation into the cause of the alert will be conducted which will include a review of the activities occurring on site, particularly in close proximity to the real-time monitor. If necessary, any dust causing activities will be paused until additional mitigation measures can be put in place to reduce dust emissions.
42. The real-time monitoring data for PM₁₀ and PM_{2.5} is to be collated into a monthly report. Any exceedances of threshold or limit values will be recorded in the Compound log book along with any actions taken to remediate high dust emissions.

1.3.6.4 Monitoring Assessment Criteria

1.3.6.4.1 Dust Deposition Limits

43. Dust deposition results will be compared to the TA Luft maximum permissible emission level for dust deposition of 350 mg/m²/day and averaged over 30 days (+/- 2 days).

1.3.6.4.2 *PM₁₀ and PM_{2.5} Limits*

44. The applicable standards in Ireland are set out in Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast). The EU formally adopted this Directive on 14 October 2024. This Directive supersedes EU Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe and sets out new air quality standards for pollutants to be reached by 2030 which are more closely aligned with the World Health Organisation (WHO) air quality guidelines.
45. The PM₁₀ and PM_{2.5} monitoring results will be compared against the air quality limit values set out in Directive (EU) 2024/2881 as indicated in Table 1.2.

Table 1.2: Air Quality Limit Values – PM₁₀ and PM_{2.5}

Pollutant	Directive (EU) 2024/2881 Limit Type	Directive (EU) 2024/2881 Limit Value (to be attained by 2030)
Particulate Matter (as PM ₁₀)	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	45 µg/m ³
	Annual limit for protection of human health	20 µg/m ³
Particulate Matter (as PM _{2.5})	24-hour limit for protection of human health - not to be exceeded more than 18 times/year	25 µg/m ³
	Annual limit for protection of human health	10 µg/m ³

1.3.6.4.3 *Threshold / Alert Trigger Levels*

46. In addition to the limit values in Table 1.2, the threshold values in Table 1.3 will be applied on site which require particular action to be taken to confirm the limit values are not exceeded. These threshold values are based on the guidance document IAQM (2018) Guidance on Monitoring in the Vicinity of Demolition and Construction Sites.

Table 1.3: Air Quality Limit Values – PM₁₀ and PM_{2.5}

Parameter	Threshold Level	Time Period	Action
Dust Deposition (Bergerhoff gauge)	200 mg/m ² /day	4-week average	<ul style="list-style-type: none"> Review site procedures and activities being undertaken in vicinity of monitoring location. Confirm mitigation measures are being implemented. Where the threshold value is exceeded for three consecutive months, review and implement additional mitigation measures where it is reasonably practicable to do so.
PM ₁₀ (Real-time monitor)	190 µg/m ³	1-hour average	<ul style="list-style-type: none"> Review site procedures and activities being undertaken in vicinity of monitoring location. Confirm mitigation measures are being implemented. Implement additional mitigation measures where it is reasonably practicable to do so.

47. All alert events are to be recorded in the site log-book with a daily report issued by the site Environmental Manager to the client partner Environmental Manager and Uisce Éireann Environmental Manager. This daily report is to include details on the cause of any emission exceedance events, the areas affected, the remedial actions taken on site and any follow up actions required.

1.3.7 Operating Vehicles and Machinery, and Sustainable Travel

48. The following measures shall be employed by the Contractor(s):

- Where bound surface and geotextiles are to be utilised in Haul Roads and compounds for the Proposed Project, they will be regularly damped down with fixed or mobile sprinkler systems and regularly cleaned
- All vehicles shall 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 20kph on Temporary Construction Roads and work areas (if long Temporary Construction Road 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)
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)
- Measures will be implemented to limit emissions from construction plant and vehicles, which will include the following, as appropriate:
 - Operation of construction plant in accordance with the manufacturer's written recommendations
 - Construction vehicles to conform to the current EU emissions standards and where reasonably practicable, their emissions will meet upcoming standards prior to the legal requirement date for the new standard
 - Vehicle and construction plant exhausts to be directed away from the ground and positioned at a height to facilitate appropriate dispersal of exhaust emissions
 - Devices such as dust extractors, filters and collectors on drilling rigs and silos will be used where practicable for the specific activities to be undertaken
 - Movement of construction traffic around the site will be kept as low as reasonably required for the effective and efficient operation of the site and construction of the Proposed Project
 - Use of tower cranes to reduce vehicle movements (if feasible)
 - The use of diesel or petrol-powered generators will be reduced by using mains electricity or battery-powered equipment where reasonably practicable
 - Sustainably sourced HVO (Hydrotreated Vegetable Oil) will be used in construction plant and equipment as a 100% replacement of fossil fuels, where available
 - Cutting and grinding operations will be conducted using equipment and techniques that reduce emissions and incorporate appropriate dust suppression measures
 - Damping down of dust-generating equipment and vehicles within the site and the provision of dust suppression in all areas of the site that are likely to generate dust
 - Vehicle, plant and equipment maintenance records will be kept on site and reviewed regularly.

1.3.8 Operations

49. The following measures shall be employed by the Contractor(s) to manage dust generated from the on-site construction activities:

- Only use cutting, grinding or sawing equipment fitted with, or in conjunction with, suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems

- There shall be an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where practicable and appropriate
- Use enclosed chutes and conveyors and covered skips
- Mixing of grout or cement-based materials will be undertaken using appropriate techniques/mitigation suitable for the prevention of dust emissions
- Reduce drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment as far as practicable and use fine water sprays on such equipment wherever appropriate
- Equipment shall be readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods
- Sand and other aggregates are to be stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case appropriate additional control measures will be in place
- Smaller supplies of fine powder materials bags will be sealed after use and stored appropriately to prevent dust.

1.3.9 Waste Management

50. The following waste management measures shall be employed by the Contractor(s):

- No bonfires and burning of waste materials
- Skips will be covered and secured
- Aim for just in time delivery
- Avoid the prolonged storage of waste materials on site.

1.3.10 Measures Specific to Earthworks

51. The following measures shall be employed by the Contractor(s) to manage earthworks activities:

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable
- Use Hessian, mulches or tackifiers where it is not feasible to re-vegetate or cover with topsoil, as soon as practicable
- Only remove the cover in small areas during work and not all at once
- Materials will be compacted after deposition, with the exception of topsoil and subsoil on land to be restored for agriculture, forestry, landscaping and wildlife habitats
- All dusty activities will be damped down, especially during dry weather
- Drop heights from excavators to vehicles involved in the transport of excavated material will be kept as low as reasonably practicable
- Topsoil will be stripped as close as reasonably practicable to the period of excavation or other earthworks activities to avoid risks associated with runoff or dust generation
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate so that moisture content is high enough to increase the stability of the soil and thus suppress dust.

1.3.11 Measures Specific to Construction

52. The following measures shall be employed by the Contractor(s) to manage construction activities:

- Avoid scabbling (roughening of concrete surfaces) if feasible

- Sand and other aggregates shall be stored in bunded areas and not allowed to dry out, unless this is required for a particular process, in which appropriate additional control measures shall be put in place
- Bulk cement and other fine powder materials shall be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery
- Concrete batching plants will have dust collectors fitted and properly maintained. The plants will also install burst bag detectors, which are connected to the automatic silo overfill protection circuit to stop the flow of cement if a filter bag bursts, in all batching plants
- Concrete batching plants will be maintained on a regular and documented schedule by a competent individual
- The mixing of grout or cement-based materials will be undertaken using a process suitable for the prevention, as far as reasonably practicable, of dust emissions
- For smaller supplies of fine powder materials, bags shall be sealed after use and stored appropriately to prevent dust.

1.3.12 Measures Specific to Trackout

53. The following measures shall be employed by the Contractor(s) to manage trackout activities:

- Avoid dry sweeping of all hardstanding areas in a single day
- Use water-assisted dust sweeper(s) or ideally a suction device for road cleaning. Suction devices can access spaces around cars and other street furniture more effectively than traditional dust sweepers, on the access points and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use
- Vehicles entering and leaving sites shall be covered to prevent escape of materials during transport
- Inspect on-site roads and paving for integrity and instigate necessary repairs to the surface as soon as reasonably practicable
- Record all inspections of Haul Roads and any subsequent action in a site log book
- Where bound surface construction infrastructure is to be utilised in the construction of the Proposed Project, they will be regularly damped down with fixed or mobile sprinkler systems and regularly cleaned
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable) – this will be in place at all Construction Compound areas and Pipe Storage Depots
- An adequate area of bound surfaced road shall be provided between the wheel wash facility and the site exit, wherever site size and layout permits
- Access gates to be located at least 10m from receptors where feasible.

1.3.13 Demolition Works

54. A small area of demolition is required at the WTP, including its access road. This includes demolition of four buildings and above ground petrol pumps at a disused petrol station. A further barn would need to be demolished in order to provide an access over the Grand Canal to the Construction Working Width. The following mitigation measures will be implemented for these specific demolition works:

- Building appraisal and demolition plan: prior to carrying out any building demolition, a detailed pre-demolition and building appraisal by means of surveys, including for asbestos, and appropriate assessments will be required. This will include the surveys listed in the following point. Based on the findings of these surveys, a demolition plan and report will be prepared. All asbestos handling work and removal shall be carried out by a licensed specialist contractor

- Building survey: this will cover items such as existing building construction materials and fabric, existing and past use, presence of wastewater and hazardous materials, potential dangerous areas, adjoining areas and site conditions, drainage conditions, any shared facilities with adjoining buildings, hoarding and covered walkway requirements, adjoining pedestrian and vehicular conditions, available space for sorting debris, local sensitive receptors with respect to noise, dust, vibration and traffic impact, and street furniture
- Reducing drop heights from conveyors, hoppers etc, as far as practicable, and use fine water sprays on equipment when appropriate
- Rubble chutes will be shielded or enclosed or use of water to suppress dust emissions from such equipment
- All cutting, grinding or sawing equipment on site shall be fitted with or used in conjunction with dust suppression techniques e.g. water sprays or local extraction
- Prior to demolition of any properties, they will be soft stripped inside the buildings (retaining walls and windows in the rest of the building where feasible, to provide a screen against dust)
- During the demolition process, explosive blasting shall be avoided, and water suppression will be used, preferably with a hand held spray.

1.3.14 Compound Specific Mitigation – Peamount Compound

55. The mitigation measures put in place to control construction dust will also be considered as mitigation measures with respect to aspergillus as they will reduce the potential for spread of the fungal spores.
56. In relation to aspergillus specifically, survey and prevention works will take place before construction commences by a competent contractor in proximity to any sensitive buildings and in particular in proximity to Peamount Hospital.
57. Prevention works will involve advising that the windows on the façades of the hospital that are in closest proximity to the works are sealed where feasible to limit dust entering the hospital through windows (in line with the National Guidelines for the Prevention of Nosocomial Aspergillosis).
58. An Aspergillus Prevention Plan will be developed by a suitably qualified specialist prior to commencement of works on the site to prevent aspergillus spores spreading.
59. The National Guidelines for the Prevention of Nosocomial Invasive Aspergillosis will be taken into consideration by the competent contractor for the Aspergillus Prevention Plan.
60. At Peamount Hospital, a real-time particulate monitor to monitor PM₁₀ and PM_{2.5} concentrations will be used. This monitor has the capability to provide alerts if particulate concentrations are elevated above set trigger levels.

1.3.15 Compound Specific Mitigation – Drummond Compound

61. The measures outlined within this plan are also applicable to the activities associated with the pipeline construction activities up to 500m to the east and west of the Drummond Compound location.
62. Bound surface construction roads will be installed alongside the boundary between the Proposed Project, Drummond Compound and the adjoining horticultural business (Monaghan Mushrooms). These will be regularly damped down with fixed or mobile sprinkler systems and regularly cleaned.
63. The Drummond Compound area will be hard surfaced (using tarmac) to reduce dust emissions to the adjoining horticultural business. This will be regularly damped down with fixed or mobile sprinkler systems and regularly cleaned.

64. Any grassed areas on site will be kept mown short to prevent flies (which are a disease vector for the adjoining highly sensitive horticultural operations). A mowing schedule will be implemented by the contractor which will include for weekly mowing of grassed areas on site during the growing season (spring/summer). The frequency of mowing will be reviewed by the contractor at regular intervals (minimum monthly) and tailored as necessary.
65. Additional real-time particulate matter monitoring of fine particulate matter (PM₁₀ and PM_{2.5}) will be undertaken at 1 no. location along the northern boundary of the site. This will give the ability to respond to short-term dust events.
66. Should any unplanned events, accidents, or spillages of potentially dusty material occur, they will be dealt with as soon as possible, taking into consideration the mitigation measures in Appendix A12.1 and this DMP.
67. The name and contact details of a person to contact regarding air quality and dust issues will be displayed on the wayleave or Construction Compound boundaries; this noticeboard will also include head/regional office contact details. Community engagement before works commence on-site will be put in place, including a communications plan. All dust and air quality complaints will be recorded and causes identified, along with the measures taken to reduce emissions. This complaints log will be available for viewing by the Local Authority, if requested. Daily on and off site inspections will occur for dust soiling.

1.4 References

Dublin City Council (2022). Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition.

Dun Laoghaire-Rathdown County Council (2022). Good Practice Guide for Construction and Demolition Environmental Management.

Health Protection Surveillance Centre (2018). National Guidelines for the Prevention of Nosocomial Aspergillosis.

Institute of Air Quality Management (2018). Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, V1.1.

Institute of Air Quality Management (IAQM) (2024). Guidance on the Assessment of Dust from Demolition and Construction (Version 2.2).

Transport Infrastructure Ireland (2022). Air Quality Assessment of Specified Infrastructure Projects - Overarching Technical Document PE-ENV-01106.

Verein Deutscher Ingenieure (VDI) (2013). VDI 2119 Ambient air measurements - Sampling of atmospheric particles > 2,5 µm on an acceptor surface using the Sigma-2 passive sampler - Characterisation by optical microscopy and calculation of number settling rate and mass concentration.

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A5.1 Annex F) Invasive Species Management Plan

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1. Introduction

1.1 Background to the Plan

1. This non-native Invasive Species Management Plan (hereafter referred to as ISMP) has been prepared for the Proposed Project. It sets out the measures that will be used by the Contractor(s) to control and prevent the spread of invasive non-native species (INNS) along the Proposed Project during the Construction Phase. Invasive Species, Invasive Alien Species or Invasive Alien Plant Species are terms sometimes referenced in legislation and/or guidance. They are referred to as INNS in this ISMP but are interchangeable.
2. The definition of INNS as prescribed by the Convention on Biological Diversity (CBD 2007) is, “*species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity*”. Invasive non-native species are found in all taxonomic groups including animals, plants, fungi and microorganisms. They can affect both terrestrial and aquatic ecosystems.
3. This ISMP will be implemented sufficiently far in advance of the proposed construction works commencing so as to allow time to adequately control all target INNS populations within the Zone of Influence (Zol) of the Proposed Project, having regard to the specific timing/seasonal constraints that apply in relation to each individual species. The presence of INNS within the Zol provides the potential for the spread of these species by the proposed construction works.
4. The ISMP will direct the Contractor(s) in implementing the specific mitigation measures required in relation to individual INNS. It will be updated by the Contractor(s) and included in future updates of the Construction Environmental Management Plan (CEMP), as appropriate and necessary, prior to commencement of works in accordance with the requirements of the CEMP.
5. In relation to the control and prevention of spread of INNS, the Contractor(s) will establish the appropriate roles and responsibilities for site staff in accordance with the roles and responsibilities set out in Section 3 of the CEMP.

1.2 Relevant Legislation and Guidance

6. The ISMP describes the options available to manage and prevent the spread of Third Schedule INNS identified in the Zol of the Proposed Project. Only invasive non-native plant species listed on the Third Schedule of S.I. No. 477 of 2011 – European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) (hereafter referred to as the Birds and Natural Habitats Regulations), and the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024), are dealt with in this ISMP.
7. The Birds and Natural Habitats Regulations contain specific provisions that govern control of listed INNS. It is an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise species listed on the Third Schedule of the Birds and Natural Habitats Regulations without a licence. The two regulations that deal specifically with this scheduled list of species are:
 - Regulation 49: Prohibition of introduction and dispersal of certain species
 - Regulation 50: Prohibition on dealing in and keeping certain species.
8. The following activities are strictly prohibited:
 - Dumping invasive species cuttings anywhere other than in facilities licensed to accept them
 - Planting or otherwise causing invasives to grow in the wild (hence the appointed Contractor will be careful not to cause further spread)

- Disposing of invasive species at a landfill site without first informing the landfill site (that is licensed under Number 10 of 1996 - Waste Management Act, 1996 (as amended)) to take such Third Schedule material (plant or soil) that the waste contains invasive species material (this action requires an appropriate licence)
 - Moving soil which contains Third Schedule-specific non-native invasive species in the Republic of Ireland, unless under licence from the National Parks and Wildlife Service (NPWS) (this licence is a separate from and does not discharge any person being in receipt of other necessary waste permits/licences).
9. Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (hereafter referred to as the IAS Regulation) lists specific “*Species of Union Concern*”, some of which overlap with the Third Schedule species. Within Ireland, this EU regulation is implemented and supplemented by the European Union (Invasive Alien Species) Regulations 2024, which outline specific measures and procedures for enforcement and implementation within Ireland's jurisdiction.
10. The IAS Regulation conveys the rules to prevent, minimise and mitigate the adverse impacts of the introduction and spread (both with and without intention) of IAS on biodiversity and the related ecosystem services, as well as other adverse impacts on human health or the economy. Ireland's 4th National Biodiversity Action Plan 2023-2030 (Government of Ireland 2024) requires that: “*by 2023, invasive alien species are controlled, managed and where possible, eradicated*”. A target of Ireland's 4th National Biodiversity Action Plan 2023-2030 is to “*reduce alien species by at least 50%*”.
11. The ISMP and the mitigation strategies that are discussed relating to invasive plant species have been prepared with regard to the following guidance documents, where relevant:
- The Management of Invasive Alien Plant Species on National Roads – Technical Guidance (Transport Infrastructure Ireland (TII) 2020a)
 - The Management of Invasive Alien Plant Species on National Roads – Standard (TII 2020b)
 - Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (National Roads Authority (NRA) 2010)
 - Managing Japanese knotweed on development sites – the Knotweed Code of Practice. Version 3, amended in 2013, withdrawn from online publication in 2016 (Environment Agency 2013). This document, although no longer supported by the Environment Agency, is nonetheless a practical document in determining the approach and control mechanisms for Japanese knotweed
 - AM-SOP-009 Information and Guidance Document on Japanese Knotweed (Uisce Éireann 2018)
 - IW-AMT-GL-007 Guidance on Biosecurity for Aquatic Sampling Activities (Uisce Éireann 2019a)
 - IW-OPM-SOP-10 Biosecurity Standard Operating Procedure for Aquatic Sampling (Uisce Éireann 2019b)
 - IW-AMT-GL-001 Irish Water Guidance on the Management of Giant Hogweed (Uisce Éireann 2024a)
 - IW-AMT-GL-002 Irish Water Guidance on the Management of Himalayan Balsam (Uisce Éireann 2024b)
 - The Office of Public Works (OPW) Arterial Drainage Maintenance Environmental Management Protocols and Standard Operating Procedures (OPW 2011)
 - Guidelines On Protection of Fisheries During Construction Works in and Adjacent to Waters. IFI/2016/I-4298 (Inland Fisheries Ireland (IFI) 2010).
12. Reference shall also be made to the Soils Management Plan (CEMP Annex B) which includes for the management of biosecurity risks during the stripping, movement and storage of soils.

13. Invasive and non-native species can be classified as high impact species or medium impact species, following a risk prioritisation study undertaken for INNS on the Island of Ireland (National Biodiversity Data Centre (NBDC) 2025). High impact species include species designated as high-risk species recorded in Ireland and those listed on the Third Schedule, Part 1 of the Birds and Habitats Regulations. Medium impact species are identified as those species that, under the right ecological conditions, could represent a threat to conservation goals.

1.3 Baseline Environment

14. A desktop review was undertaken of the NBDC records of INNS within the study area of the Proposed Project. Following on from this review, field surveys were undertaken between 2016 and 2025 to record INNS within the Proposed Project study area, within the optimal botanical season (April to September) when species are readily observable and identifiable. Full details of the surveys are included in Chapter 8 (Biodiversity) in the Environmental Impact Assessment Report (EIAR) and the results are summarised in Section 1.3.1 and Section 1.3.2.

1.3.1 Terrestrial INNS

15. A desktop review of NBDC records of invasive non-native terrestrial flora was carried out for the 10km grid squares encompassing the Proposed Project. From the review of NBDC records a total of 30 INNS were noted, of which 11 are listed on the Third Schedule of the Birds and Natural Habitats Regulations. These 11 species are:

- Parrot's-feather (*Myriophyllum aquaticum*)
- Giant hogweed (*Heracleum mantegazzianum*)
- Giant knotweed (*Fallopia sachalinensis*)
- Giant-rhubarb (*Gunnera tinctoria*)
- Himalayan balsam (*Impatiens glandulifera*)
- Japanese knotweed (*Reynoutria japonica*)
- Rhododendron (*Rhododendron ponticum*)
- American skunk-cabbage (*Lysichiton americanus*)
- Himalayan knotweed (*Persicaria wallichii*)
- Three-cornered leek (*Allium triquetrum*)
- Spanish bluebell (*Hyacinthoides hispanica*).

16. In total, 14 INNS were recorded at 70 locations within the study area of the Proposed Project during surveys, which included: rhododendron, Japanese knotweed, montbretia (*Crocasmia × crocosmiiflora*), Himalayan knotweed, butterfly-bush (*Buddleja davidii*), cherry laurel (*Prunus laurocerasus*), snowberry (*Symphoricarpos albus*), giant rhubarb, wall cotoneaster (*Cotoneaster horizontalis*), common milkweed (*Asclepias syriaca*), traveller's-joy (*Clematis vitalba*), winter heliotrope (*Petalites pyrenaicus*), giant hogweed and Himalayan balsam. All of these species, other than montbretia, winter heliotrope, snowberry, common milkweed, wall cotoneaster and butterfly bush, are listed on the Third Schedule of the Birds and Natural Habitats Regulations.

1.3.2 Aquatic INNS

17. A NBDC review of aquatic macroinvertebrate data within the 10km grid squares encompassing the Proposed Project was undertaken. The results showed the medium impact INNS, Jenkins' spire snail (*Potamopyrgus antipodarum*) and the high impact (Birds and Natural Habitats Regulations) zebra mussel

have been recorded within the 10km grid squares that encompass the Proposed Project, with a particularly high abundance in Lough Derg, upstream of the RWI&PS.

18. The Asian clam was recorded in both the River Shannon and Upper Lough Derg in surveys in 2011 and 2012 (Minchin 2014). However, studies carried out from Lower Lough Derg to the Parteen Basin Weir between January 2011 and July 2016 did not reveal any clams in this region (Minchin 2016).
19. A NBDC review of invasive non-native aquatic plant species within the 10km grid squares encompassing the Proposed Project was undertaken. The results showed the presence of six INNS, four of which are listed on the Third Schedule of the Birds and Natural Habitats Regulations, namely; curly waterweed, fringed water-lily (*Nymphoides peltata*), Nuttall's waterweed and water fern. Furthermore, one high impact (but not listed on the Third Schedule) invasive non-native aquatic plant species, Canadian waterweed (*Elodea canadensis*), and one medium impact invasive non-native aquatic plant species, least duckweed (*Lemna minuta*), were also recorded.
20. Although not an aquatic species, Himalayan balsam can inhabit riverbanks and is therefore considered herein. During the 2019 to 2024 surveys, Himalayan balsam was recorded along the Knockadromin Stream (WCX002), the River Liffey (WCX073), the Reeves Stream (WCX074), and the Kilmastulla at WCX077. This INNS was also recorded during the 2018 and 2020 surveys along a drainage ditch at WBX087. Canadian waterweed was recorded in 2018 at Daingean River (WCX048) and Esker Stream (WCX050). Himalayan balsam is a high impact INNS and is listed on the Third Schedule (Part 1) of the Birds and Natural Habitats Regulations.
21. The common roach (*Rutilus rutilus*) was recorded on two occasions at Esker Stream (WCX049) in 2018 and once at Daingean River (WCX048) in 2020, once within the Grand Canal (WBX078) in 2024 and once within the Headrace Canal (PSNWCX005) in 2024. Roach is a medium impact INNS and is also listed on the Third Schedule (Part 1) of the Birds and Natural Habitats Regulations.
22. During surveys conducted in August 2021 at Lough Derg and Parteen Basin (RWI&PS), zebra mussel, quagga mussel (*Dreissena rostriformis bugensis*), starry stonewort (*Nitellopsis obtuse*), and Nuttall's waterweed were recorded (EIAR Appendix A8.19: Aquatic Invasive Species Survey Report). Both the zebra mussel and Nuttall's waterweed are high impact INNS. Quagga mussel is listed on the Third Schedule Part 2 of the Birds and Natural Habitats Regulations.

1.4 Control Measures for Management of Invasive Non-Native Species

23. The ISMP will be implemented sufficiently far in advance of the proposed construction works commencing so as to allow time to adequately control all target INNS populations within the Zol of the Proposed Project, having regard to the specific timing/seasonal constraints that apply in relation to each individual species. The ISMP will direct the Contractors in implementing the specific mitigation measures required in relation to individual INNS.

1.4.1 Pre-Construction Survey

24. During the time elapsed between the completion of initial INNS surveys and the commencement of works, it is possible that the existing stands of Third Schedule INNS may have changed. Invasive non-native species may have expanded (if unmanaged) or decreased (if there is an active management regime in place), or newly established Third Schedule INNS may have become established within the Planning Application Boundary of the Proposed Project.
25. Pre-construction surveys will be undertaken by a suitably qualified Ecological Clerk of Works (ECoW) to confirm the absence, presence and/or extent of all Third Schedule INNS within the Planning Application Boundary. Where the presence of Third Schedule INNS is confirmed within the Planning Application Boundary, this will require the implementation of the ISMP. Data collected as part of the pre-construction

INNS survey will include a detailed description of the population(s) including the approximate coverage of respective colonies (recorded in m² (metres squared)). Where feasible, records will include the total number of stems, pattern of growth, and information on other vegetation present. This information will enable calculations of volumes of infested soils to be excavated, where necessary.

26. Following on from the pre-construction INNS survey, the ISMP will be updated, as advised by a suitably qualified ECoW, with regard to the Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII 2020a) and Standard (TII 2020b) and other species-specific guidance documents including those listed in the ISMP, as necessary. The updated ISMP will detail the strategy that will be adopted during the Construction Phase in order to manage and prevent the spread of INNS, and where Third Schedule INNS are encountered directly in the works area, the method of treatment/eradication.

1.4.2 Site Establishment

27. Prior to the commencement of construction, any areas where Third Schedule INNS have been recorded by the pre-construction surveys shall be clearly fenced off prior to and during construction (in order to avoid spreading seeds or plant fragments around or off the construction site) until such time that the mitigation measures are implemented and treatment has been completed, or that works in these areas are monitored in accordance with the requirements of the ISMP. This includes the entirety of the works within the Proposed Project Planning Application Boundary. Earthworks or machinery movement shall be avoided in any areas where Third Schedule INNS have been identified during the pre-construction surveys, until the relevant stands have been eradicated.

1.4.3 Biosecurity

28. The Contractor(s) will ensure that the spread of INNS, where present, is curtailed. It is also necessary to ensure that in areas where INNS are not present, that they are not unintentionally spread (e.g. through the importation of contaminated material being brought onto the site).
29. Unwashed construction equipment, plant, vehicles, and footwear can provide a vector for the spread of INNS within the working area of the Proposed Project and from areas outside of the Proposed Project, where infestation is present or where vector material potentially containing seed/root material is attached to plant.
30. The following biosecurity measures will be implemented for the Proposed Project:
- Known stands of INNS or potentially affected areas within the working area of the Proposed Project will be clearly fenced off in advance of works. Access in these areas will be restricted until such time that treatment has commenced and/or construction works are monitored in accordance with the ISMP in the area. In relation to knotweed species, the guidance recommends an exclusion buffer of 7m in all directions (within the works area and 3m vertically underground)
 - Erection of clear signage and inclusion of details during toolbox talks or similar (environmental induction) for construction staff in respect of the management of Third Schedule INNS. The signage and notification will be easily understood so that users are aware of the measures to be taken for known INNS, or what they should do in the case of suspected INNS identified. In particular, the potential health risks posed by giant hogweed and its location within or adjacent to the Proposed Project will be clearly notified to personnel
 - Identify dedicated access points into and out of fenced off areas. These will not be breached until such time that eradication/removal of INNS is confirmed or monitoring of the treatment/eradication process is commenced
 - Where feasible, the locations of dedicated footwear and wheel wash facilities will be identified in the ISMP. Where a dedicated/bespoke wheel wash cannot be installed owing to space limitations, the appointed contractor will ensure that no excavated loose material is allowed offsite from within an exclusion zone. Similarly, where plant is used to excavate soils, it will be visually checked for

loose soil before movement to another part of the site (as far as practicable, the movements of tracked machinery will be restricted within the INNS exclusion zone). Loose soil will be scraped off and disposed of, and a solution of Virkon© (or similar approved disinfectant) will be applied to machinery to ensure that no obscured seed/root material remains viable

- Vehicular movements within the exclusion area will be minimised as far as is practicable
- Machinery which has been used for the transport and/or excavation of contaminated vector material (or material suspected to be contaminated) will be thoroughly washed down with water >60 degree Celsius, and the washings captured for disposal. If it is not feasible to steam clean the equipment, a normal power hose will be used. All such machinery/plant will not be permitted to commence work elsewhere on-site or offsite until written confirmation of the above measures has been documented
- If soil is imported to the site for landscaping, infilling or embankments, the Contractor will gain documentation from suppliers that it is free from non-native invasive species
- All washings will be stored in a quarantined bunded container that is rated for such storage until such time that they are removed offsite for disposal and transferred to a facility that is authorised to accept such waste
- Except in very particular circumstances, under the guidance of the ECoW, there will be no temporary storage of contaminated soils (or soils suspected to be contaminated) on-site. These shall be removed from site as per the guidance in Section 1.2.
- Where small volumes (e.g. volumes capable of being double bagged in quarantine bags such as cut plants, bulbs or loose soil) occur, it may be practicable to bag the material and bring it to a clearly demarcated and dedicated quarantine area within the Construction Compounds until such time that the material is disposed of to an authorised facility, similar to the process of disposing of bulk excavated infected soil.

31. Where machinery and vehicles will be working in a contaminated area, site hygiene measures shall be strictly followed. It is also noted that it may not be feasible to completely eradicate the INNS before or during the Construction Phase and ongoing management may be required into the Operational Phase (any requirements for the Operational Phase will be captured in a Handover Environmental Management Plan following completion of the works).

1.4.4 Mitigation Measures to Control and Prevent the Spread of Terrestrial INNS and Pathogens

32. Any INNS plant material noted on-site or within 15m of working areas will be treated and/or removed off site and disposed of at an appropriate licensed waste disposal facility, in compliance with the Birds and Natural Habitats Regulations. The presence of INNS and requirement for actions will be confirmed and supervised by an ECoW.

33. Where reasonably practicable, an Advance Treatment Plan will be prepared by a qualified ECoW and will set out details of the area to be treated (including detailed plans), the methods to be used (which will typically be chemical treatment in advance of construction), measures to protect any surrounding habitat areas and any ongoing recommendations for the later Construction Phase.

34. There are three main types of INNS control methods, including:

- Mechanical / physical control
- Chemical control
- Biological control.

35. Selecting the correct form of control will depend on the target species. Often, INNS are managed using a combination of different control and treatment types. Integrating multiple forms of control can offer a more effective, economic and sustainable way of managing INNS (see Table 1.1).

1.4.4.1 Mechanical/Physical Control

36. Mechanical or physical control entails damaging or removing the plant by physical action. Different techniques can be used (e.g. uprooting, felling, slashing, mowing, ringbarking or bark stripping). This control option is only feasible in sparse infestations or on a small scale, and for controlling species that do not coppice after cutting. Species that tend to coppice need to have the cut stumps or coppice growth treated with herbicides following the mechanical treatment. Mechanical control is labour intensive and therefore expensive and could cause severe soil disturbance and erosion. For sites with no existing dense stands of INNS plant species, hand-pulling or manual removal using hand tools will be the most appropriate methods.
37. A precautionary approach will also be taken to prevent the intentional spread or acceleration of the natural spread of ash dieback in the Zol of the Proposed Project. Pre-construction surveys of all treelines and hedgerows which will be removed as part of the Proposed Project will be undertaken by a qualified arborist. All trees noted as having ash dieback will be flagged and demarcated. If ash trees are young, uprooting is possible. Larger trees will be cut as close to ground level as possible with the tree stump treated with glyphosate herbicide (McCracken et al. 2017). Cut trees will be removed to a licensed landfill site. Chipping will be carried out for larger trees under a covered trailer and chips removed to a licensed landfill facility (McCracken et al. 2017). The understorey and ground of affected hedgerows and treelines will be thoroughly checked for dead leaf litter (includes bark, leaves, twigs, remaining roots) and trimmings by the arborist, and removed to a licensed landfill facility as dead leaf litter is key in the life cycle of ash dieback and the primary source of risk of the disease (Sansford 2015).

1.4.4.2 Chemical Control

38. Chemical control will only be used as a last resort, since it is hazardous for natural vegetation. It should not be necessary if regular monitoring is undertaken, which will be effective for controlling plant INNS. Chemical control involves the use of registered herbicides to kill the target weed. Managers and herbicide operators shall have a basic understanding of how herbicides function. The use of inappropriate herbicides and the incorrect use of the appropriate herbicides are wasteful and expensive practices and often do more harm than good, especially when working close to watercourses. Some herbicides can quickly contaminate fresh water and/or be transported downstream where they may remain active in the ecosystem. Herbicides are either classified as selective or non-selective. Selective herbicides are usually specific to a particular group of plants (e.g. those specified for use on broadleaved plants but should not kill other plants such as grasses). Non-selective herbicides can kill any plant that they come into contact with and are therefore not suitable for use in areas where native vegetation is present. Chemical application techniques can include foliar (leaf) application, stem applications (basal stem, total frill, stem injections) and stump applications (cut stump, total stump, scrape and paint).
39. The application of herbicides/pesticides will be undertaken by staff who have sufficient training, experience and knowledge in this area and which may include achieving competency certification in the safe use of herbicides/pesticides. In order to ensure the safety of herbicide applicators and of other public users of the site, a suitably qualified pesticides advisor, registered with the Department of Agriculture, Food and the Marine shall be employed. The appointed Contractor will be required to refer to the appropriate guidance documents, including but not limited to those listed in Section 1.2, which provide detailed recommendations for the control of invasive species and noxious weeds. These documents include measures to aid the identification of relevant species, with details for the timing, chemicals and methodology for chemical control (if applicable), and for measures to avoid environmental damage during the use of herbicides. The appointed Contractor (or the specialist as appropriate) will update the ISMP in accordance with the relevant guidelines before commencing works. It should be noted that where a chemical treatment is to be used, there is a risk of contaminating a watercourse. The choice of herbicide is typically limited to formulations of Glyphosate or 2,4-D amine that are approved for use near water. Full details of any chemical used, where required and as advised by a registered pesticides advisor, will be included in the ISMP prepared in advance of the Construction Phase of the Proposed Project.

1.4.4.3 Biological Control

40. Biological weed control consists of the use of natural enemies of INNS to reduce the vigour or reproductive potential of a plant INNS. Biological control agents include insects, mites, and micro-organisms such as fungi or bacteria. They usually attack specific parts of the plant, either the reproductive organs directly (flower buds, flowers or fruit) or the seeds after they have dropped. The stress caused by the biological control agent may kill a plant outright or it might impact on the plant's reproductive capacity. In certain instances, the reproductive capacity is reduced to zero and the population is effectively sterilised. All of these outcomes will help to reduce the spread of the species.

1.4.5 Mitigation Measures to Control and Prevent the Spread of Aquatic INNS and Pathogens

41. All plant and equipment employed on the construction site (e.g. excavator, footwear) will be thoroughly cleaned down using a power washer unit into a contained area prior to leaving site at access/egress points, to prevent the spread of INNS aquatic/riparian species such as Japanese knotweed and crayfish plague in accordance with the OPW Environmental Standard Operating Procedures (OPW 2011), IFI Biosecurity Protocol (IFI 2010) and Uisce Éireann guidelines (UÉ 2018; 2024a; 2024b).

42. Additional care will be taken near watercourses, and any aquatic survey work that may be carried out (e.g. electrofishing and trapping) will comply with best practice biosecurity protocols for aquatic work (IFI 2010).

43. During the testing and commissioning phase, care will be taken to avoid the spread of INNS through the abstraction and discharge of hydrostatic test water. The source of test waters will be sampled to determine the presence of INNS species (e.g. Zebra mussels, crayfish plague). Where reasonably practicable, hydrostatic test water will only be discharged back to the same waterbody. Where presence of INNS is identified, a suitable treatment method will be employed, sufficient to remove/kill all INNS present.

44. A sign-off sheet will be maintained and checked daily or as required, to confirm cleaning. Staff involved in the works will be informed as to the presence of INNS in the area. All staff working on the Proposed Project will be familiar with the sections within the document Management of Invasive Alien Plant Species on National Roads – Technical Guidance (TII 2020a) which details the treatment necessary for the aforementioned species, together with the required reporting procedure if encountered.

1.4.6 Management Methods

45. The general measures included in Section 1.4 are required to ensure good on-site practices in respect of known or potential Third Schedule INNS. This further identifies practical management controls. The colour scheme shown in Table 1.1 is a qualitative tool intended to indicate the most likely practicable solutions. It is acknowledged that more than one potential control measure exists and that a single or combination of measures may be required. The recommendations presented in this ISMP provide the minimum requirements for the likely control measures, and these measures will be developed (with further detail on methodology used at each location, timing, practical management, etc.) by the appointed Contractor (or the ECoW as appropriate). The use of chemical treatments is recognised as a potential treatment option. However, the services of a registered pesticide advisor shall be employed in the specifying of named chemicals including those rated for use adjacent to aquatic environments (where required), treatment type, dosage, and timing, etc., and/or use of pesticides in the management of potential Third Schedule INNS within the Planning Application Boundary. The selected management control to be defined for each INNS stand within the Planning Application Boundary will depend on:

- Results of the pre-construction survey
- Construction requirements – timing of works at specific locations, level of infestation and practical considerations such as reducing disturbance to road users/homeowners.

46. The ISMP, which will be updated following on from the pre-construction surveys, may require the utilisation of a number of controls that are described in Table 1.1.

Table 1.1: Management Methods

Species	Approach	Treatment Option	Comment	Potential for Implementation
Rhododendron <i>(Rhododendron ponticum)</i>	Physical	Hand dig/mechanical	Physical removal of rhododendron can be achieved by uprooting the plant by hand or chainsaw if the stand is small or recent, or uprooting larger plants/stands by winching (either hand operated or tractor mounted). The plant will be cut as close to the ground as possible. For small shrubs or seedlings hand-pulling is effective however for larger stands the removal of above ground growth will not prevent re-growth, as plants can regenerate from cut stems and stumps. Total eradication by targeting the underground rhizome is the most effective method.	Likely
		Cutting	The plant may be cut down to the stump, as low to the ground as possible and the stump treated with herbicide.	This is a long-term solution and will require commitment from relevant bodies to undertake.
	Chemical	Spray	This can be undertaken throughout the year during suitable weather conditions i.e. dry weather. The direct treatment of stumps means that there is no standing dead regrowth to deal with. This treatment also results in a lower volume of herbicide being applied, compared with foliar treatments.	Possible where ground is to be excavated, may require physical control also.
Japanese knotweed <i>(Reynoutria japonica)</i>	Physical	Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorised to accept it. In addition to waste permits/authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule INNS off site.	Likely – given the nature of the Proposed Project, there may be a need to excavate soil and plant material to enable construction works to go ahead in timely manner.
		Below ground removal	Japanese knotweed can extend over 7m below ground, although there are reports of certain types of soil, such as heavy clays, that it does not penetrate. Excavations will also be to 3m below the surface if removing Japanese knotweed from a site. Wherever feasible, the amount of Japanese knotweed excavated will be kept to a minimum and focus will be directed to treating the Japanese knotweed in its original location.	Possible – location dependent. Large amount of space required to accommodate extensive removal.
		Cutting and/or strimming	Not recommended and does not diminish vigour of plants over time. Largely cosmetic and can result in considerable spread of viable vegetative material that can readily regenerate on suitable conditions.	Not recommended.
	Chemical	Spot/spray	Spot and spray methods are used for isolated plants or large populations using knapsack or weep sprayers. In accessible areas, including along riverbanks, lance sprayers can be used. Chemical treatments for infestations near water will be rated for use at or near aquatic locations.	Chemical treatments are often a preferred option for treating Japanese knotweed, but the process can take between 3 to 5 years before eradication can be guaranteed and requires at least 2-year post implementation monitoring. Given the nature of the Proposed Project, the use of chemical treatment alone is unlikely to be adequate unless a treatment regime begins a number of years before construction commencement.
		Stem injection	Stem injection is very effective, if the injection is timed appropriately for growth phase. However, it is labour-intensive requiring some cutting and is usually only carried out on small/isolated populations.	Possible - requires specialist equipment to enable working alongside the biohazardous plant, despite some advantages over other conventional chemical treatments e.g. reduces drift, not weather dependent.

Species	Approach	Treatment Option	Comment	Potential for Implementation
Himalayan knotweed (<i>Persicaria wallichii</i>)	Physical	Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorised to accept it. In addition to waste permits/authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule INNS off site.	Likely – given the nature of the Proposed Project, there may be a need to excavate soil and plant material to enable construction works to go ahead in timely manner.
		Below ground removal	Himalayan knotweed can extend over 7m below ground, although there are reports of certain types of soil, such as heavy clays, that it does not penetrate. Excavations will also be to 3m below the surface if removing Himalayan knotweed from a site. Wherever possible, the amount of Himalayan knotweed excavated will be kept to a minimum and focus will be directed to treating the Himalayan knotweed in its original location.	Possible – location dependent. Large amount of space required to accommodate extensive removal.
		Cutting and/or strimming	Not recommended and does not apparently diminish vigour of plants over time. Largely cosmetic and can result in considerable spread of viable vegetative material that can readily regenerate on suitable conditions.	Not recommended.
	Chemical	Spot/spray	Spot and spray methods are used for isolated plants or large populations using knapsack or weep sprayers. In accessible areas including along riverbanks, lance sprayers can be used. Chemical treatments for infestations near water will be rated for use at or near aquatic locations.	Chemical treatments are often a preferred option for treating Himalayan knotweed, but the process can take between 3 to 5 years before eradication can be guaranteed and requires at least 2-year post implementation monitoring. Given the nature of the Proposed Project, the use of chemical treatment alone is unlikely to be adequate unless treatment regime begins a number of years before construction commencement.
		Stem injection	Stem injection is very effective, if the injection is timed appropriately for growth phase. However, it is labour-intensive (sometimes) requiring some cutting) and is usually only carried out on small/isolated populations.	Possible - requires specialist equipment to enable working alongside the biohazardous plant, despite some advantages over other conventional chemical treatments e.g. reduces drift, not weather dependent.
Giant-rhubarb (<i>Gunnera tinctoria</i>)	Physical	Dig and dispose offsite, under licence	Physical removal using spades is a viable option for small plants, or where a small number of plants are present, plant material missed in the first removal can be monitored and subsequently removed. This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorised to accept it. In addition to waste permits/authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule INNS off site.	Likely – given the nature of the Proposed Project, there may be a need to excavate soil and plant material to enable construction works to go ahead in timely manner.

Species	Approach	Treatment Option	Comment	Potential for Implementation
	Chemical	Spot/spray	Spraying to be carried out using a backpack sprayer and all leaves are thoroughly sprayed until the point of "run-off", using the manufacturers recommended concentrations. Spraying shall be carried out on still, cool, dry days. Rainfall soon after application may wash the herbicide off the leaves and reapplication will be necessary. Protective clothing and a mask shall be used at all times when handling herbicides. The cut and paint method involves cutting the petiole (the leaf stalk) at the base and immediately applying the herbicide on to the cut surface using a brush or sponge. Injection of herbicides involves using a drill to make small wells in the rhizome that are then filled with herbicide. Several wells will be made along the rhizome as translocation can be slow and the herbicide may only penetrate small sections of the rhizome. This method is more labour intensive, but the effects on the neighbouring environment are minimised.	Possible where ground is to be excavated, may require physical control also.
Giant hogweed <i>(Heracleum mantegazzianum)</i>	Physical	Hand pulling	Hand pulling is only suitable for small/immature plants (and with suitable Personal Protective Equipment (PPE) to protect exposure of bare skin by the sap) and limited small areas/infestations. Potential remains for tap root to remain underground and regenerate.	Unlikely for mature plants. Requires specialist equipment to enable working alongside the biohazardous small / immature plants.
		Root cutting	Individual plants may be killed by cutting at a 45-degree angle 15cm below ground level with a spade in April or May. Can be laborious unless small/isolated stands. Can be effective if combined with chemical treatment over four to five years repeat treatment.	Given the nature of the Proposed Project, could be used to remove biohazard plant and thereafter allow for chemical control against any regrowth. Requires specialist equipment to enable working alongside the biohazardous plant.
		Mowing	Repeated mowing depletes the energy reserves in the taproot and it eventually dies. This approach will take several years and will only be used where long-term treatment is acceptable. Trimmers, strimmers or weed whackers, will never be used on giant hogweed as they can result in the airborne spray of pulverised plant material.	This is long-term solution will require commitment from relevant bodies to undertake.
		Grazing	Grazing will begin when early foliage appears in April and will continue until early autumn when re-sprouting stops. Eradication can take between 5 to 10 years so that seed bank and root stock is fully depleted of resources. Avoids herbicide use.	Possible, but unlikely given the nature of the Proposed Project and that this will require a change in land management and commitment from relevant bodies to undertake.
		Ploughing	Can provide total control where seedlings and young plants encroach onto agricultural land. Chemical treatment required over 3-5 years.	Unlikely given the locations that giant hogweed is often found in.
		Dig and dispose offsite, under licence	This option requires that all plant material (above and below ground) is excavated along with soil and disposed of to a facility authorised to accept it. Given the phytotoxic nature of the plant, it will not be buried onsite nor disposed of with general construction waste. In addition to waste permits/authorisations, a wildlife licence issued by NPWS is required for the transport of Third Schedule INNS offsite.	Possible – location dependent.
	Chemical	Spot treatment/spray	Effective method. Applications shall be repeated annually over 3-5 years to eradicate new plants growing. Chemical treatments for infestations near water will be rated for use near aquatic locations.	Most widely used method. Long-term commitment of treatment. Possible but unlikely owing to nature and size of population recorded along the Proposed Project.

Species	Approach	Treatment Option	Comment	Potential for Implementation
		Stem injection	Can only be carried out on young stems. Due to difficulties with the timing of application and the potential safety risk of contact with the large leaves this method requires specialist safety equipment.	Possible, requires specialist equipment to enable working alongside the biohazardous plant.
Himalayan balsam (<i>Impatiens glandulifera</i>)	Physical	Hand pulling	Hand pulling of Himalayan balsam is considered to be the most effective treatment option for smaller stands as the species is shallow rooted (10 to 15cm). As the species frequently occurs along watercourses, this is a preferable form of treatment as it limits the potential impacts on the surrounding environment and facilitates the re-establishment of native vegetation. It is also the best method where the species occurs in mixed stands of vegetation. If soil contaminated with seed material needs to be excavated, then either burial on-site or disposal of the soil material off-site may be required.	Likely
		Mechanical cutting	Repeated cutting is an effective control measure for large stands of Himalayan balsam. Plant stems will be cut at ground level (below the first node), which is easier on plants 50cm or greater. When the stem is cut above the first node, the species will regrow extremely vigorously and potentially produce more flowers and seeds than it will have otherwise. Cutting will be undertaken in May when plants have reached 50cm but have not yet developed seedpods. A scythe, flail, strimmer or mower can be used. Repeated mowing or cutting may be required annually until no more growth occurs. As above, the plants removed will then be placed in an area away from any watercourses, covered with jute material and left to degrade naturally. If soil contaminated with seed material needs to be excavated, then either burial on-site or disposal of the soil material off-site may be required.	Possible, but requires long-term commitment.
	Chemical	Spot/spray	Chemical control using glyphosate or 2,4-D amine, undertaken in the spring prior to flowering but late enough for germinating seedlings to be affected (typically late April/early May), is a suitable treatment method where physical control is not possible. Repeat treatment for a minimum of two to a maximum of five years may be required for complete eradication of the species. Treatment by herbicide can be achieved with a weed wiper in mixed stands, or by foliar spray in dense stands. Repeat checks will be required on a monthly basis for any late germinating seeds. Repeat checks will be carried out each year throughout the growing season to prevent any new plants from setting seed until no further growth is found. Note, most products which contain the active ingredient 2, 4-d amine are not approved for use near water; however they may be more appropriate for use away from water as they do not affect grasses. If soil contaminated with seed material needs to be excavated, then either burial on-site or disposal of the soil material off-site may be required.	Possible, requires specialist equipment to enable working alongside the biohazardous plant.

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Environmental Impact Assessment Report (EIAR)

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(Appendix A5.1 Annex G) Register of Environ- mental Actions and Commitments

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Acronyms and abbreviations

Acronym	Meaning
BPS	Booster Bumping Station
BPT	Break Pressure Tank
CAP	Climate Action Plan
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CPPA	Corporate Power Purchase Agreement
CWBPMP	Construction Waste and By-Product Management Plan
DoHLGH	Department of Housing, Local Government and Heritage
EC	European Commission
ECoW	Ecological Clerk of Works
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
ESBN	Electricity Supply Board Networks
EU	European Union
FCV	Flow Control Valve
FRA	Flood Risk Assessment
GI	Ground Investigation
GSI	Geological Survey Ireland
GWS	Group Water Scheme
GWDE	Groundwater Dependent Terrestrial Ecosystem
IFI	Inland Fisheries Ireland
INNS	Invasive Non-Native Species
ISMP	Invasive Species Management Plan
KER	Key Ecological Receptor
LLO	Land Liaison Officer
MSDS	Material Safety Data sheets
NBDC	National Biodiversity Data Centre
NMS	National Monuments Service
NPWS	National Parks & Wildlife Service
NRA	National Roads Authority
NSL	Noise sensitive location
NVMP	Noise and Vibration Management Plan
OPW	Office of Public Works
PWS	Public Water Supply
PBR	Potential bat roost

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Acronym	Meaning
PCAS	Peatland Climate Action Scheme
PM ₁₀	Particular matter of an aerodynamic diameter of equal or less than 10 micrometres
PM _{2.5}	Particular matter of an aerodynamic diameter of equal or less than 2.5 micrometres
REAC	Register of Environmental Actions and Commitments
RPA	Root protection area
RWI&PS	Raw Water Intake & Pumping Station
SMP	Soil Management plan
SWMP	Surface Water Management Plan
TPR	Termination Point Reservoir
WTP	Water Treatment Plant
ZoI	Zone of influence

1. Register of Environmental Actions and Commitments (REAC)

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
General									
GN1	CEMP	Develop CEMP	<p>The CEMP will be updated prior to commencement of any works. The CEMP will detail the measures that shall be undertaken prior to, and during construction of the Proposed Project. The construction of the Proposed Project must be carried out in accordance with the approved CEMP. The CEMP must be based on, and incorporate, the requirements of the application CEMP (Appendix A5.1) and shall include the implementation of industry standard practice and control measures for environmental impacts arising during construction. The CEMP will incorporate (as a minimum) and adhere to the supporting management plans presented within the annexes of the application CEMP. These plans include:</p> <ul style="list-style-type: none"> • Surface Water Management Plan • Traffic Management Plan • Waste and Byproduct Management Plan • Dust Management Plan • Noise and Vibration Management Plan • Soil Management Plan • Invasive Species/Biosecurity Management Plan 	Yes (as defined per each management plan).	To ensure the CEMP is appropriate to the project phase and the scope of works delivered by the Contractor(s), including requirements of conditions attached to statutory consents.	Each contractor will prepare a specific, targeted CEMP for their own section of the pipeline/works that complies with the application CEMP (Appendix A5.1).	Approval of CEMP and associated plans.	Contractor(s)	Pre-construction
GN2	CEMP	General Site Operations	General site operations and good practice measures set out in Section 5 of the CEMP will be implemented.	Yes (as defined in the CEMP)	To reduce environmental impacts.	The assessment assumes these good practice measures are implemented.	Implementation of the CEMP.	Contractor(s)	Construction
GN3	CEMP	Training	<p>Construction workers will undergo training to increase their awareness of environmental issues where appropriate to their role. Topics will include, but not be limited to:</p> <ul style="list-style-type: none"> • Dust management and air quality control • Location and protection of sensitive environmental sites and features (including buffer zones where appropriate) • Noise management • Water receptors present onsite and working in or near watercourses • Surface water pollution and control, for example silt management • Use of spill kits and emergency response procedures • Agreed traffic management measures (e.g. haulage routes, carriageway restrictions, carriageway closures and diversions) 	No	To reduce environmental impacts.	The assessment assumes that construction workers would undergo training prior to any construction works.	Implementation of the CEMP.	Contractor(s)	Pre-construction Construction
GN4	CEMP	Communication Plan	A Construction Phase Communications Plan will be developed and implemented, detailing the approach to managing external communications to stakeholders and communities.	No	To ensure appropriate advanced notifications are given to stakeholders and communities.	Produced by each Contractor, under the supervision of the designated Uisce Éireann Land Liaison Officer (LLO).	Implementation of the Construction Phase Communications Plan.	Contractor(s)	Pre-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
Noise and Vibration									
NV1	CEMP – Annex D	Noise and Vibration Management Plan	Update and implement the Noise and Vibration Management Plan (NVMP), setting out general standard, good practice mitigation and monitoring measures for noise and vibration, based on, as a minimum, the measures set out in Annex D of the CEMP. It is the responsibility of the contractor(s) to ensure that all measures in these documents are adhered to.	Yes, as detailed in the NVMP	Mitigate against negative noise and vibration effects arising from construction of the Proposed Project.	Each contractor will prepare a specific, targeted NVMP for their own section of the pipeline/works that complies with the NVMP in Annex D of the CEMP.	Implementation of the NVMP.	Contractor(s)	Pre-construction Construction
NV2	Chapter 6 (Noise and Vibration) Section 6.5 CEMP – Annex D	Hoarding and localised noise screening	Hoarding and localised noise screening around noisy items of plant will be required in areas identified within Section 6.5 of EIAR Chapter 6 relating to: <ul style="list-style-type: none"> An area of working in peat between chainages TWB-24500 and TWB-25000 (if piling required) Night-time works at trenchless crossings and directional drilling locations Along the boundary of the TPR with Peamount Hospital. Hoarding will also be utilised along each side of the identified Construction Compounds and Pipe Storage Depots in line with the CEMP (EIAR Appendix A5.1).	No	Reduce the impacts of construction noise on Peamount Hospital and other noise sensitive receptors identified.	Assumes good practice measures are also implemented, as set out in the NVP in CEMP Annex D.	Implementation of the NVMP.	Contractor(s)	Construction
NV3	Chapter 6 (Noise and Vibration) Section 6.5 CEMP – Annex D	Night-time noise	In addition to hoarding and noise screening, the trenchless crossing and directional drilling locations identified in REAC measure NV2 will have the following mitigation: <ul style="list-style-type: none"> Selection of quiet plant Monitoring Liaison with the public during the planned night-time works. 	Yes, as detailed in the NVMP	Reduce the impacts of night-time construction noise on noise sensitive receptors near trenchless crossing and directional drilling locations.	Assumes good practice measures are also implemented, as set out in the NVP in CEMP Annex D.	Implementation of the NVMP.	Contractor(s)	Construction
NV4	Chapter 6 (Noise and Vibration) Section 6.5 CEMP – Annex D	Duration of time-time works	At the detailed design stage, the appointed Contractor will consider if it is feasible to further reduce the duration of the night-time works at the trenchless crossings and directional drilling locations.	No	To further reduce the potential for noise impacts from night-time works.	Noise impacts constitute a significant effect where it is determined that a major or moderate magnitude of impact would occur for a duration exceeding: <ul style="list-style-type: none"> 10 or more days or nights in any 15 consecutive days or nights A total number of days exceeding 40 in any six consecutive months. 	Durations below temporal thresholds.	Contractor(s)	Pre-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
NV5	Chapter 6 (Noise and Vibration) Section 6.5 CEMP – Annex D	Groundborne vibration	Implement the general measures set out in the NVMP. In addition, specific mitigation for groundborne vibration is as follows where likely significant effects have been identified in EIAR Chapter 6 (Noise & Vibration): <ul style="list-style-type: none"> • Vibration from piling - Adopting press in piling techniques for the installation of the piles. This involves pushing in the piles into the soft ground (peat) and thereby avoiding the generation of vibration • Vibration from rock breaking - Using non-hydraulic rock breaking methods close to sensitive properties. This will include the use of conventional excavators with toothed buckets or 'ripping' tools where practicable. Using lower vibration emitting breakers when working in close proximity to sensitive properties • Vibration from trenchless construction techniques - Designing the cutting face of the tunnel boring machine (or equivalent) so that the level of vibration generated at source is reduced. 	Yes, as detailed in the NVMP	Avoid or reduce significant effects from groundborne vibration.	Significance thresholds are: <ul style="list-style-type: none"> • 1mm/s ppv for human response if occurring over 10 or more consecutive days (i.e. disturbance) • 8mm/s ppv for structural effects. 	Effects below significance thresholds.	Contractor(s)	Pre-construction Construction
NV6	Chapter 6 (Noise and Vibration) Section 6.5	Operational noise	At the detailed design stage, the appointed Contractor will consider the selection of plant and façade elements so that the infrastructure sites will operate within the following noise limits <ul style="list-style-type: none"> • Daytime Noise Criterion (07:00 to 19:00hrs) - 45 dB $L_{Ar,T}$ • Evening Noise Criterion (19:00 to 23:00hrs) - 40 dB $L_{Ar,T}$ • Night-time Noise Criterion (23:00 to 07:00hrs) – 35 dB $L_{Aeq,T}$ 	No	To comply with operational noise limits.	Noise levels taken from Section 6.2.6.3 of EIAR Chapter 6. Noise levels apply at nearest noise sensitive locations.	Design revisions to comply with operational noise thresholds.	Contractor(s) Uisce Éireann	Pre-construction
Traffic & Transport									
TT1	Chapter 7 (Traffic and Transport) Section 7.5 Appendix A7.2 (Traffic Management Plan)	Traffic Management Plan	Update and implement the Traffic Management Plan for all construction activities using the mitigation measures presented in EIAR Appendix A7.2 (Traffic Management Plan) as a minimum. The Traffic Management Plan will include, but not be limited to, information on: <ul style="list-style-type: none"> • Traffic management measures • Carriageway restrictions • Carriageway closures and diversions. 	Yes, as per the Traffic Management Plan in EIAR Appendix A7.2.	To ensure continued performance of road network, protect safety for all travellers and minimise disruption to communities.	Requirements of EIAR Appendix A7.2 are implemented.	Implementation of the Traffic Management Plan.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
Biodiversity									
B1	Chapter 8 (Biodiversity) Section 8.8	Supervision of works	<p>All mitigation measures will be implemented by the appointed Contractor(s), under the supervision of an Ecological Clerk of Works (ECoW). The ECoW will oversee and implement all ecological mitigation contained in the EIAR, Natura Impact Statement and REAC, and act as a liaison between Uisce Éireann and the Planning Authority in the discharge of ecology planning conditions. The role of the ECoW will include:</p> <ul style="list-style-type: none"> Organising pre-construction monitoring surveys to confirm the presence of protected species and invasive non-native species (INNS) Arranging relevant licensing (if required) Supervising construction works and ensuring compliance with legislation Monitoring habitats and species during the course of construction works and effectiveness of mitigation Providing advice regarding the avoidance and minimisation of potential disturbance to wildlife Providing recommendations on appropriate responses/actions to site-specific issues (e.g. on identification of previously unrecorded breeding sites during construction works) Liaising with National Parks and Wildlife Service (NPWS), Inland Fisheries Ireland (IFI) and other prescribed authorities, when required. 	Yes, by ECoW	Prevent negative impacts on biodiversity during construction of the Proposed Project and ensure the correct implementation of Biodiversity mitigation.	N/A	ECoW approval for site clearance works. Legal compliance in relation to protected species.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B2	Chapter 8 (Biodiversity) Section 8.8	Restoration of habitats following the completion of construction	<p>Habitats will be reinstated/restored by preparing the soil and reseeded with species specific to the habitat in question.</p> <p>For semi-natural grassland habitats, where necessary, the locally sourced seedbank present within the surrounding land will be used for grassland restoration following the green hay transfer method (as per Great Irish Grassland guidance).</p> <p>Where natural regeneration is not feasible, or where specific plant species need to establish quickly, habitats will be reinstated by preparing the soil appropriately (i.e. with the existing soil geographic factors, including soil type, soil pH and nutrient content) and reseeded with native locally sourced species specific to the habitat in question.</p> <p>Heath habitat (i.e. HH1 and HH3) will be reinstated as per EIAR Appendix A5.3 (Methods of Working in Peat). Reseeding will then be carried out with ling heather and bell heather brush with additions of locally sourced bilberry and crowberry (<i>Empetrum nigrum</i>), shrubs, sedges (e.g. green-ribbed Sedge (<i>Carex binervis</i>) and natural grasses (e.g. bents and fescues)).</p> <p>Habitats which cannot be reinstated on a like-for-like basis (e.g. PB1 mosaic habitats and PF2) due to their unique composition and underlying processes which contribute to their existence, will be reinstated with a habitat similar to that of PB4 in the case of PB1 habitat and species rich GS3 in the case of PF2 habitat.</p> <p>Watercourses and drainage ditches throughout the Proposed Project will be planted up with like-for-like wetland herbs and grasses at appropriate locations under the direction of the ECoW.</p> <p>Uisce Éireann Tree Protection Guidance (IW-AMT-GL-026) (Uisce Éireann 2022) will be followed for replanting trees along the 20m wide Permanent Wayleave. This will consist of a mosaic habitat similar to that of a mature hedgerow.</p> <p>Hedgerow reinstatement will be carried out on a like-for-like basis and as per the Biodiversity Guidance for Uisce Éireann Developments (UÉ-AMT-GL-021) (Uisce Éireann 2023b) and EIAR Figure 4.98 which will be implemented as follows:</p> <ul style="list-style-type: none"> Where gaps within an existing hedgerow are to be reinstated or bolstered, it will be done so using a combination of mainly feathered whips and occasional advanced nursery stock (minimum 10 to 12cm girth trees to fill gaps). This method employs the principles of 'under-planting' feathered whips to the inside of the existing hedgerow and 'inter-planting' of whips and advanced nursery stock within gaps. Where a new hedgerow is to be reinstated it will be done so using a mix of age classes from feathered whips and advanced nursery stock to develop an immediate hierarchy in the structure of the hedgerow. 	Yes - see REAC measure B25	To ensure that habitats are restored to their pre-disturbance condition, following completion of the Proposed Project.	<p>Reinstatement will be under direction of ECoW, taking into consideration the All-Ireland Pollinator Plan 2021-2025 (NBDC 2021) and the Pollinator Friendly Planting Code (NBDC 2022).</p> <p>Replacement of the excavated soils in the correct order in which they were excavated.</p> <p>Reinstatement will occur as soon as possible upon completion of the works in order to minimise the time for which soil or peat are required to be stored and the period of exposed excavations. However, this will be subject to careful planning by the Contractor to avoid the necessity to track back over areas of previously restored ground or further disturbance of recovering areas.</p> <p>Natural regeneration of vegetation, where feasible, by reusing the stored topsoil seedbank from its original location for reinstatement.</p> <p>Follow measures to manage soil compaction as per the Soil Management Plan (see REAC measure SG1).</p>	<p>Like-for-like habitat replacement.</p> <p>Improved condition of retained hedgerows.</p>	Contractor(s)	<p>Construction</p> <p>Post-construction</p>

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B3	Chapter 8 (Biodiversity) Section 8.8	Protection of hedgerows and trees during the construction	<p>Any required tree cutting and lopping will be minimised. Pollarding will be undertaken by qualified arborists so as to retain as much of the treeline/linear habitat structure and in a manner which retains ground flora species.</p> <p>Any habitats including trees, scrub or hedgerows adjacent to, or within, the Proposed Project which are intended to be retained will be afforded adequate protection, by complying with National Roads Authority (NRA) Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes, prior to construction works commencing. The mitigation measures which will be implemented will include:</p> <ul style="list-style-type: none"> • Temporary fencing of Root Protection Areas (RPAs) for all retained trees • The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials will not be undertaken within 10m of any retained trees, hedgerows or treelines • If any excavation is required within an RPA, a qualified arborist will advise on the best methods for protecting tree roots • Any remedial works required to trees will be carried out by a qualified arborist • Where tree removal may be required (due to health and safety considerations) in areas not previously identified, liaison with a suitably qualified ECoW will be undertaken. 	No	Protection of retained trees and hedgerows.	<p>ECoW and/or arborist to supervise works as required.</p> <p>Where fencing is not feasible due to insufficient space, protection for the trees will be afforded by wrapping hessian sacking (or equivalent) and timber strips clad around the tree.</p>	No loss of retained trees and hedgerows.	Contractor(s)	Pre-construction Construction
B4	Chapter 8 (Biodiversity) Section 8.8	Protection of rare flora during construction	<p>Two species of formerly protected, rare (Red Listed) flora were recorded within the Proposed Project: basil thyme and yellow archangel. The ECoW will review all construction works potentially impacting these plants and will implement appropriate measures to protect them. The approach employed will be as follows:</p> <ul style="list-style-type: none"> • Ensure appointed Contractors are aware of all ecological sensitivities prior to commencement of works • Assign designated areas for stockpiling of excavated material during construction in consultation with an ECoW to avoid disturbance and loss of any rare/protected flora • Exclusion zones will be established by installing temporary fences around the rare/protected flora • Where feasible, plants will be left <i>in situ</i> and protected during construction • Where impacts are unavoidable, prior to clearance works taking place, plants will be translocated in the autumn when soils are warm and moist and new root growth is possible before the onset of winter. • Cutting, storage and translocation of turves (vegetated topsoil) will be carried out under supervision of the ECoW, with reference to procedures set out in Chapter 8 Biodiversity. 	Yes, supervision by ECoW	Protection of basil thyme and yellow archangel	<p>Priority will be to leave the plants <i>in situ</i> in order to avoid or minimise disturbance, but where this is not feasible, the plants will be translocated permanently.</p> <p>Potential translocation areas identified on the Environmental Masterplan (EIAR Figures 4.106 to 4.184). The exact translocation area(s) will be agreed with the ECoW.</p>	Successful retention or translocation of impacted flora.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B5	Chapter 8 (Biodiversity) Section 8.8 CEMP – Annex F	Controlling the spread of INNS during construction	<p>The Invasive Species Management Plan (ISMP) in the Annex F of the CEMP (Appendix A5.1) will be updated and implemented following pre-construction surveys. The ISMP will describe how non-native plant and animal species will be managed or removed where required in order to prevent their spread in the terrestrial and aquatic environment during construction of the Proposed Project.</p> <p>The ISMP also details methods for the control of Ash dieback during construction of the Proposed Project.</p>	Yes, as per ISMP in CEMP Annex F	Prevent the spread of INNS during construction of the Proposed Project.	Each contractor will prepare a specific, targeted ISMP for their own section of the pipeline/works that complies with the ISMP in Annex F of the CEMP.	Implementation of the ISMP.	Contractor(s) Uisce Éireann	Pre-construction Construction Operation
B6	Chapter 8 (Biodiversity) Section 8.8 Appendix A8.9 Bat Surveys Report	Protection of bats during construction	<p>Pre-construction Tree Surveys and Tree Removal:</p> <p>All trees with medium to high bat roost potential will be examined by a suitably qualified ECoW prior to felling as part of the pre-construction surveys.</p> <p>Where a roost is confirmed, and where the tree is required to be felled, it is necessary to seek derogation from the NPWS to exclude the bats and fell the tree. The roost must not be altered or affected in any way prior to the time of felling. Felling must be carried out under the supervision of a bat specialist named on the licence, using the measures stipulated in the licence.</p> <p>The following measures will be undertaken:</p> <ul style="list-style-type: none"> Trees identified as a PBR and proposed to be felled will be re-surveyed (dusk survey coupled with night-vision aids). This will be undertaken at least one month prior to tree felling in order to propose a tree felling plan in conjunction with tree contractors. Trees with roosting features (e.g. dead wood, tree holes) will be physically checked prior to felling (using an endoscope and high-power torch) or a dusk/dawn surveys completed to determine if bats are roosting within. Erection of alternative roosting sites (see B7) and provision of bat boxes (see B8) will be undertaken in advance of any tree felling. All mature trees in need of removal that have been identified as having a moderate to high PBR value will be felled in the autumn or spring months during mild weather in order to avoid any breeding populations. March should be avoided as it is within the bird nesting season. Felling of these trees must also be avoided in cold winter months as there is the potential for bats to be in hibernation. An assessment of trees according to their PBR value determines the methodology of felling. Trees with PBR Category 1 are highly suitable for roosting bats and require more intensive procedures prior to felling. The trees identified within the study area are PBR Category 1, 2 and 3. The procedures to fell these is as set out in Section 6.1 of Appendix A8.9 of the EIAR. 	Yes, supervision by ECoW	<p>Protection of bats during construction of the Proposed Project.</p> <p>To inform bat licence applications for tree removal.</p> <p>To ensure legal compliance.</p>	Given the need to remove five bat roosts and the impacts on bats predicted for the Proposed Project, a Bat Derogation Licence application has been submitted to NPWS.	Compliance with licence conditions.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B7	Chapter 8 (Biodiversity) Section 8.8 Appendix A8.9 Bat Surveys Report	Protection of bats during construction	<p>Provision of bat roosts:</p> <p>The proposed construction works will result in the loss of five known bat roosts (building roost at Birdhill plus four tree roosts). A bat house will be constructed as an alternative roost in an area of land within the Planning Application Boundary to the north-east of the WTP, as shown on EIAR Figure 4.63.</p> <p>The following principles will be followed:</p> <ul style="list-style-type: none"> The alternative bat roost will be constructed one year prior to tree felling and building removal The new roost will be located as close as possible to the existing roosts The location of the alternative roost will be placed close to existing flight lines and foraging habitat to increase its success The design will take into consideration the requirements of the species concerned (lesser horseshoe bat, Natterer's bat, brown long-eared bat and soprano pipistrelle) The alternative roost will be designed to provide suitable thermal regimes Opportunities will be taken to provide a variety of roosting opportunities to maximise the value of the structures for bats Woodland planting has been specified around the bat house to provide screening, commuting and foraging The design and materials of the bat house will be in accordance with the specifications set out in Section 6.1 of Appendix A8.9 of the EIAR. 	Yes, to monitor the use of the bat house (see REAC measure B25)	Protection of bats during construction of the Proposed Project.	<p>Given the need to remove five bat roosts and the impacts on bats predicted for the Proposed Project, a Bat Derogation Licence application has been submitted to NPWS.</p> <p>Refer to Marnell <i>et al.</i> (2022) and Schofield (2008) – see Chapter 8 Biodiversity.</p> <p>Bat house is for loss of roosts at Building 1 and Tree C. Bat boxes will be erected as alternative roosts for PBR 8 and PBR 20 (see REAC measure B8).</p>	Bat house erected and occupied.	Contractor(s)	Pre-construction Construction
B8	Chapter 8 (Biodiversity) Section 8.8 Appendix A8.9 Bat Surveys Report	Protection of bats during construction	<p>Provision of bat boxes:</p> <p>In addition to the bat house, a total of 50 summer bat boxes (Schwegler Woodcrete 1FF bat box or equivalent) will be erected to mitigate for the loss of PBRs proposed to be felled as well as general bat conservation measures.</p> <p>The bat boxes will be located within core sustenance zones where suitable mature trees are available to erect bat boxes on. The bat boxes will be erected six months prior to any tree felling.</p> <p>Bat boxes will be sited carefully and erected under the supervision of a bat specialist, in accordance with the specifications set out in Section 6.1 of Appendix A8.9 of the EIAR. They will be spread out across the Proposed Project but required in vicinity of PBR 8 (two bat boxes, where feasible) and PBR 20 (four bat boxes, where feasible).</p>	Yes, to monitor the use of the bat boxes (see REAC measure B25)	Protection of bats during construction of the Proposed Project	<p>Given the need to remove five bat roosts and the impacts on bats predicted for the Proposed Project, a Bat Derogation Licence application has been submitted to NPWS.</p> <p>Indicative bat box locations identified on the Environmental Masterplan (EIAR Figures 4.106 to 4.184).</p> <p>Telegraph poles to be used if no suitable trees for bat box.</p>	Bat boxes erected and occupied.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B9	Chapter 8 (Biodiversity) Section 8.8	Protection of bats during construction	<p>Bat Disturbance: Temporary screens will be required for:</p> <ul style="list-style-type: none"> • Areas where the removal of linear habitats may impact on bat flight lines, in order to provide alternative commuting paths until new planting is sufficient in height • Areas where outdoor lighting is proposed (particularly along rivers and other water bodies) in order to prevent such lighting spilling on dark bat commuting zones • Within the 2km of the core sustenance zone for lesser horseshoe bat, as this species is particularly sensitive to the loss of linear habitats. <p>At watercourse crossings and in close proximity to known bat roosts, works will cease at sunset (unless essential for health and safety purposes) in order to minimise disturbance from lighting and noise to foraging or commuting bats.</p> <p>Where lighting is essential (Health and Safety purposes only), the overspill of light will be minimised through directional lighting and aimed directly onto the works and not the wider landscape.</p>	No	Protection of bats during construction of the Proposed Project.	N/A	Compliance with mitigation to satisfaction of ECoW.	Contractor(s)	Construction
B10	Chapter 8 (Biodiversity) Section 8.8	Protection of badgers during construction	<p>Pre-construction surveys: A pre-construction survey will be conducted along suitable habitats (e.g. woody vegetation) within the Proposed Project, no more than 10 to 12 months in advance of construction. The survey will be supplemented by a further inspection of the development area immediately prior to site clearance. The findings of these surveys will inform site clearance activities and exclusion zones.</p>	No	<p>Protection of badgers during construction. To inform the requirement for:</p> <ul style="list-style-type: none"> • Exclusion zones • Sett closures • New artificial setts (number and locations) <p>To ensure legal compliance.</p>	N/A	Up to date records of badger setts within vicinity of Proposed Project.	Contractor(s)	Pre-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B11	Chapter 8 (Biodiversity) Section 8.8	Protection of badgers during construction	<p>Badger disturbance: Mitigation measures and procedures required in relation to badger disturbance, are as follows:</p> <ul style="list-style-type: none"> A 30m buffer, extended to 50m for active setts during the breeding season (Dec-Jun) will be marked out around the setts, using barrier tape. Where any works are planned in the Zol of these exclusion zones, an ECoW will be contacted prior to any such works. The ECoW will ensure that the appointed Contractor(s) complies with required mitigation Night-time working will be restricted as far as practicable within 150m of a sett. As badgers are nocturnal, disturbance will be reduced by restricting the amount of night-time working within the Zol of a sett. Night-time, in terms of badger nocturnal activity, is defined as beginning one hour before sunset and lasting to one hour after sunrise The use of noisy construction machinery in the Zol of badger setts will cease before sunset. Excavations will either be covered, fenced or have an escape ramp installed overnight to prevent badgers, or other wildlife, from falling in and becoming trapped Pile-driving works will not be undertaken within 150m of a sett during the breeding season. In unavoidable circumstances, works closer to active setts may take place during the breeding season provided appropriate mitigation measures, in line with guidelines, are in place (e.g. sett screening, restricted working hours). Any spoil heaps will be sited at a minimum distance of 30m from setts Chemicals will not be used within 30m of a badger sett Mammal-proof fencing to be installed in the Zol of a sett to exclude badgers will be hand-dug under supervision. Regular monitoring of mammal-proof fencing will be undertaken by the ECoW to determine any possible defects, gaps and/or weaknesses. 	Yes, supervision by ECoW	Protection of badgers during construction	N/A	Compliance with exclusion zone requirements. Deployment of mammal-resistant fencing. No badgers trapped by temporary works.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B12	Chapter 8 (Biodiversity) Section 8.8	Protection of badgers during construction	<p>Badger sett exclusion and removal:</p> <p>Where the destruction of active badger setts cannot be avoided exclusion and destruction will be carried out under the supervision of an appropriately qualified ECoW. Evacuation and destruction will be undertaken from 1 July to 30 November (outside of the breeding season). Exclusion of badgers from disused or currently inactive setts is not seasonally restricted and can be conducted at any time under the supervision of a suitably qualified and experienced ECoW.</p> <p>Where surveys show the destruction of a main and/or annex sett will be required, and no suitable alternative natural setts are present, the construction of an artificial sett may be recommended. The artificial setts will be established at least six months prior to exclusion, in close proximity to existing setts, as shown in the Environmental Masterplan (EIAR Figures 4.106 to 4.184). The construction and location of potential artificial setts will be agreed in advance with the NPWS and the Department of Agriculture Food and Marine Local Veterinary Office. The construction of an artificial sett will follow Scottish Natural Heritage Guidance for the Creation of Artificial Setts (2018), as set out in EIAR Chapter 8 Biodiversity (Section 8.8.2.3).</p> <p>A period of monitoring will be required in order to determine use of the artificial sett by badgers. The duration and frequency of monitoring will be site-specific, depending on when and if badgers colonise, and will be agreed with the ECoW.</p>	Yes, supervision by ECoW. Monitoring use pre-construction. Monitoring use of artificial setts (see REAC measure B25).	Protection of badgers during construction.	Based on survey results at the time, the EIAR anticipated the need to destroy 33 badger setts. Number and location of artificial setts required to be informed by pre-construction surveys.	Successful closure of all setts as required. Occupation of new artificial setts.	Contractor(s)	Pre-construction Construction
B13	Chapter 8 (Biodiversity) Section 8.8	Protection of otters during construction	<p>Pre-construction surveys:</p> <p>Confirmatory pre-construction surveys for otter (resting or breeding places) will be undertaken no more than 10-12 months in advance of the commencement of any works in order to identify any changes in otter activity or holt/couch locations/status and to verify the mitigation proposals accordingly.</p>	No	Protection of otters during construction. To ensure legal compliance.	N/A	Up to date records of otter holts.	Contractor(s)	Pre-construction
B14	Chapter 8 (Biodiversity) Section 8.8	Protection of otters during construction	<p>Otter disturbance:</p> <p>The prohibited working area associated with otter holts will be fenced and appropriate signage erected.</p> <p>No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts.</p> <p>Light work, such as digging by hand or scrub clearance will not take place within 15m of such holts, except under licence.</p> <p>No works will be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place provided appropriate mitigation measures are in place, e.g. screening/hoarding. Breeding may take place at any season, so activity at a holt will be determined on a case-by-case basis, where required.</p>	Yes, supervision by ECoW	Protection of otters during construction.	Adherence to NRA 2008 Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. A Disturbance to Otter Derogation Licence application has been submitted to NPWS for three otter holts.	Compliance with exclusion zone requirements. Deployment of mammal-resistant fencing.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B15	Chapter 8 (Biodiversity) Section 8.8	Protection of otters during construction	<p>Otter holt closure:</p> <p>For any new holts discovered during pre-construction surveys where holt destruction is required, the following will apply:</p> <p>For active holts, otters will be evacuated from the holts prior to any closures. Otters with cubs however will not be evacuated until the otters have vacated the holt themselves naturally. In the case of non-breeding active holts, general disturbance (e.g. vegetation clearance) and chemical deterrents will be used first to encourage the otters to vacate the holts. Once the otters have left the holt, the entrance will then be soft blocked. In some cases, the installation of one-way gates on the entrances to the holt may be required and a monitoring period of 21 days will be carried out to ensure the otters have left the holt prior to removal.</p> <p>Where holts have been verified as inactive (subject to a period of monitoring - five or more days of checking activity at the holt either with sticks or with sand pads to identify footprints), and to prevent their reoccupation, the entrances will be soft blocked. If the entrances remain undisturbed for five days, the holt will then be destroyed immediately using a mechanical digger, under the supervision of the holder of an NPWS licence.</p> <p>Where pre-construction surveys confirm the destruction of an active breeding holt will be required, and no suitable alternative natural holts are present, the construction of an artificial holt may be recommended as an alternative to mitigate for the loss. Artificial holt(s) will be constructed prior to exclusion of an active holt, in close proximity to the existing holt. The construction and location of a potential artificial holt will be agreed in advance under licence with the NPWS.</p>	<p>Yes, supervision by holder of NPWS derogation license.</p> <p>Monitoring holt to ensure otters have left before removal.</p> <p>Monitoring of use of artificial holts, to be agreed with ECoW.</p>	<p>Protection of otters during construction.</p> <p>To ensure legal compliance.</p>	<p>Adherence to NRA 2008 Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes.</p> <p>No known otter holts require closure. Three otter holts were recorded within the Proposed Project (see Table 8.38 in EIAR Chapter 8). Two holts were found to be active while the other was recorded as inactive (to be confirmed by pre-construction surveys). Although all three otter holts are located within the confines of the Proposed Project, destruction of the holts will not be required as they are set back from proposed infrastructure/works. The primary impact to address for these three holts is in relation to disturbance associated with the construction works (see REAC measure B14).</p>	<p>Compliance with licence conditions.</p>	<p>Contractor(s)</p>	<p>Construction</p>
B16	Chapter 8 (Biodiversity) Section 8.8	Protection of other mammals during construction	<p>There is no known method for excluding pine marten, pygmy shrew or hedgehog from breeding/nest sites and therefore the seasonal clearance of vegetation for breeding birds (1 March to 31 August) will be implemented as far as practicable (see REAC measure B22).</p> <p>Where the construction programme or conflicting mitigation does not allow this seasonal restriction to be observed, these areas will be inspected by an ECoW in advance in order to determine whether any protected fauna are present. If any are encountered, the vegetation clearance will be delayed until the protected fauna have moved away from the area, e.g. when a nest has been abandoned.</p> <p>Hedgehogs hibernate over winter typically under log piles or tree roots or within dense vegetation and scrub. If construction works are undertaken during winter months, such vegetation or potential nests at risk of disturbance or removal will be inspected by an ECoW for the presence of hibernating hedgehog prior to any removal. If any are encountered, the vegetation clearance will be delayed until they have moved away from the area.</p>	<p>No</p>	<p>Protection of other mammals during construction:</p> <ul style="list-style-type: none"> • Pine marten • Pygmy shrew • Hedgehog 	<p>The seasonal clearance of vegetation for breeding birds coincides with the breeding season for these protected mammals.</p>	<p>Compliance with mitigation to satisfaction of ECoW.</p>	<p>Contractor(s)</p>	<p>Pre-construction Construction</p>

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B17	Chapter 8 (Biodiversity) Section 8.8	Protection of invertebrates during construction	<p>Marsh Fritillary: Pockets of devil's-bit scabious will be retained where feasible and fencing will be used to protect them from construction activities to provide long-term opportunities for colonisation.</p> <p>All areas identified as suitable habitat to support the marsh fritillary butterfly will be subject to a pre-construction larval web survey. This will be undertaken during the mid-August to the end of September window, immediately preceding site clearance works. If larval webs are present, they will be translocated to suitable habitat outside of the working area that can be fenced off and avoided. Once all larval webs have been removed from the affected areas, or if no larval webs were recorded, the vegetation will be immediately cleared or cut to ground level to render the area unsuitable for the species to recolonise. The vegetation will be maintained in this state until such time as the topsoil is removed.</p>	No	Protect Marsh Fritillary during construction	<p>Location of known devil's-bit scabious shown on EIAR Figures 8.109 to 8.212.</p> <p>Areas within the Proposed Project where marsh fritillary was recorded during baseline surveys, as well as area identified as suitable habitat to support the marsh fritillary, are identified on the Environmental Masterplan EIAR Figures 4.106 to 4.184).</p>	Successful retention or translocation to suitable new habitat.	Contractor(s)	Pre-construction Construction
B18	Chapter 8 (Biodiversity) Section 8.8	Protection of invertebrates during construction	<p>Two protected snails, Lilljeborg's whorl snail and brown snail, which were recorded at the RWI&PS site, will be collected and transferred to alternative suitable habitat outside of the working area in advance of construction.</p> <p>Brown snail has a very fragile shell, therefore these snails will be collected by hand (rather than sweep netting) from the areas where it is present within the RWI&PS site. A potentially suitable receiving site outside of the working area (deciduous woodland with similar lush grassy marginal areas or woodland rides) is shown in the Environmental Masterplan (EIAR Figures 4.106 to 4.184). Monitoring will be carried out to check for the presence of this snail prior to releasing collected specimens, and then sampling of the recipient site after three and six years to gather information on the success of the introduction.</p> <p>For Lilljeborg's whorl snail, a thorough search of the shoreline that would be impacted by the RWI&PS will be undertaken by hand searching and sweep netting prior to construction works commencing. Any snails found will be translocated to an alternative location with similar habitat outside of the working area. No ongoing monitoring of this snail is proposed due to the difficulties of finding it.</p>	Yes, prior to and after translocation.	Protection of two protected snails during construction: <ul style="list-style-type: none"> • Lilljeborg's whorl snail • Brown snail 	Potential translocation areas identified on the Environmental Masterplan (EIAR Figures 4.106 to 4.184).	Successful translocation to suitable new habitat.	Contractor(s) Uisce Éireann	Pre-construction Construction Post-construction (monitoring)

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B19	Chapter 8 (Biodiversity) Section 8.8	Protection of amphibians during construction	<p>Common frog - A pre-construction survey will be undertaken if construction works are to be carried out between January to July (i.e. their breeding season). The pre-construction survey will be carried out where frogspawn/tadpoles were recorded (EIAR Figures 8.109 to 8.212) and in suitable breeding habitats identified within the Proposed Project (FL8, FW4, GS4, HH3, PB1, PF2, WN5, WN6, WN7; EIAR Figures 8.4 to 8.108). Any frog spawn, tadpoles, juveniles or adult frogs found will be removed by hand net and translocated to the nearest available suitable habitat, under licence from the NPWS.</p> <p>Smooth newt - A pre-construction survey will be undertaken if construction works are to be undertaken between February to June (i.e. their breeding season). The pre-construction survey will be carried out where smooth newt/effs/larval were recorded (EIAR Figures 8.109 to 8.212) and in suitable breeding habitats identified within the Proposed Project (FL8, FW4, PF2; EIAR Figures 8.4 to 8.108). Smooth newt will be captured and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of suitable habitat. The type and design of traps will be approved by the NPWS.</p> <p>If the size or depth of the habitat feature is such that it cannot be determined whether all amphibians have been captured, it will be drained under the supervision of a suitably experienced ECoW to confirm that no amphibian species remain before it is destroyed or infilled. Any mechanical pumps used to drain the habitat feature will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism. Any capture and translocation works will be undertaken immediately prior to construction.</p>	Yes, supervision by ECoW	<p>Determine if breeding amphibians are present.</p> <p>Protect amphibians during construction.</p> <p>Ensure legal compliance.</p>	Suitable receptor habitat will be available within the Proposed Project that will not be affected by the works.	Successful translocation of captured amphibians.	Contractor(s)	Pre-construction Construction
B20	Chapter 8 (Biodiversity) Section 8.8	Protection of reptiles during construction	<p>Pre-construction surveys will be undertaken. In areas where common lizard has been confirmed during pre-construction surveys, vegetation will be removed during the winter period avoiding potential hibernacula sites (dry sites which provide frost-free conditions e.g. stone walls, underground small mammal burrows, piles of dead wood). Where this is not practicable and clearance will be undertaken during the active season (March through to September, inclusive), vegetation will be cut first to approximately 15cm, and then to the ground, under supervision of an ECoW to allow the opportunity for lizards to leave the affected area.</p> <p>Stone walls (or other potential hibernacula sites) will be removed during the active season (March through to September, inclusive) under the supervision of an ECoW.</p>	Yes, supervision by ECoW	Protection of common lizard	Given the broad range of habitat types favoured by the common lizard, and that the Proposed Project passes through mosaics of such habitats, site clearance works at any time of year in suitable habitat are likely to encounter the species.	Compliance with mitigation to satisfaction of ECoW.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B21	Chapter 8 (Biodiversity) Section 8.8	Aquatic ecology: protection of fish and crayfish during construction	<p>All surface water works will be carried out in accordance with the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016), or as otherwise agreed with IFI during the construction stage.</p> <p>Electrofishing and release will be undertaken at all sites with potential for fish to become trapped within the works. This includes:</p> <ul style="list-style-type: none"> The area of Parteen Basin enclosed by a double silt curtain for construction of the raw water intake Dammed sections of watercourse for flume or over-pumping required for open cut crossings. Fish will be released upstream of the crossings. <p>At open cut watercourse crossings, a pre-commencement white-clawed crayfish survey will be undertaken to ensure no crayfish occur within the works areas, and if present, individuals will be trapped and translocated (under licence) upstream of works.</p> <p>In-stream works will not be carried out in watercourses frequented by salmon or trout during the annual close season and will be undertaken outside of the lamprey spawning season. The duration of the season for salmonids varies regionally. The timing of works will be considered on a site-specific basis (typically works can be carried out during the period July to September) and in agreement with IFI, as some rivers have late spawning salmonids.</p> <p>Where applicable, and under the supervision of a suitably qualified ECoW, salmonid spawning gravels (if encountered) will be removed at the stream crossing points prior to construction works taking place; subject to the prior agreement with IFI. The spawning gravels will be stockpiled on geotextile filter fabric, clearly marked and taped off adjacent to the watercourse crossing and will be used to reinstate the stream bed. Where juvenile lamprey habitat is encountered (fine sand/silt substrates) the same process will be applied where the habitat will be removed prior to construction and reinstated to the original profile, subject to prior agreement with IFI.</p> <p>Following completion of backfilling, riverbed and banks will be reformed to match their original profile. Banks will be reinstated using natural materials and revegetated immediately following works. Monitoring of these areas will be undertaken by the ECoW to ensure establishment with remedial works undertaken where required. All aquatic habitats found within the watercourse crossing locations will be reinstated to their original form.</p> <p>If during the detailed design or construction stages, it becomes necessary to culvert any watercourse, then the culverts will be sized in accordance with IFI 2016 Guidelines and the OPW's Section 50 consents (OPW 2021) so as not to interfere with upstream and downstream movement of aquatic life or cause backing up of the river increasing the water level.</p>	Yes, supervision by ECoW	Prevent damage to aquatic ecology during construction. To ensure legal compliance.	<p>Compliance with mitigation measures set out in the Surface Water Management Plan (see REAC measure W1) will address water quality issues.</p> <p>River and brook lamprey spawn during the period March to April, while sea lamprey spawn during the period May to August. Instream works may be carried out between October and March if juvenile lamprey are translocated; however, the salmonid spawning season will still need to be considered.</p> <p>Consultation and agreement with IFI will be required for all in-stream works, in particular the need for seasonal constraints for salmonid waters.</p> <p>See Table 8.42 in EIAR Chapter 8 Biodiversity for spawning habitat, salmonid, lamprey and/or crayfish potential and their proposed crossing methodology.</p>	<p>No fish mortality.</p> <p>Successful translocation of any white-clawed crayfish found.</p> <p>Compliance with licence conditions.</p>	Contractor(s)	Construction Post-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B22	Chapter 8 (Biodiversity) Section 8.8	Ornithology-Breeding Birds	<p>Vegetation clearance will generally be avoided between 1 March and 31 August, to avoid impacts on nesting birds. Where the construction programme or conflicting mitigation does not allow this seasonal restriction to be observed, these areas will be inspected by an ECoW for the presence of breeding birds prior to clearance. Where nests are present, the ECoW will mark out a suitable buffer zone around an active nest and clearance within this area will be postponed until the chicks have fledged. A suitable buffer zone will be established depending on the species identified. Areas found not to contain nests will be cleared within three days of the inspection; otherwise repeat inspections will be required. If vegetation is to be cleared in the breeding season (under supervision of an ECoW) it will be chipped, removed or covered (ideally) on the same day to prevent birds from nesting.</p> <p>Due to the permanent loss of a barn owl breeding nest site within the boundary of the Proposed Project, an artificial nest box will be installed, designed specifically for barn owls, within the territory of the breeding site that will be lost.</p>	<p>Yes, supervision by ECoW.</p> <p>Monitoring of barn owl box for 5 years post-construction</p>	Protection of breeding birds.	<p>One nest box will be installed at an appropriate location within the territory of the barn owl breeding site that will be lost, at a location in the townland of Ballyhugh or Springfield County Offaly, between Chainage TWC – 19400 to TWC – 20000. The new site within the Proposed Project will be selected by the judgement of suitably qualified ornithologist and be based on habitat suitability, availability of foraging areas (such as rough grassland, field margins, and hedgerow networks), and low risk of predation or human interference. The box will be installed in a secure, elevated position, either on a suitable mature tall tree along an existing treeline or woodland edge or if no suitable location exists, on a custom-built pole and will be designed following the guidance outlined by Lusby and McCarthy (2022).</p>	Minimum destruction of breeding bird nests.	Contractor(s) Uisce Éireann	Construction Post-construction
B23	Chapter 8 (Biodiversity) Section 8.8	Ornithology-Wintering Birds	<p>In areas identified as 'important bird areas' for wader and waterbird species, where concentrations of breeding or wintering KERs (Key Ecological Receptor) have been recorded, seasonal restrictions will be implemented, during which no vegetation clearance or construction activity will take place. Where it is not possible to fully avoid works during these periods due to programme constraints, conflicting mitigation or safety considerations, an ECoW will be present to undertake pre-works inspections and oversee activities in accordance with REAC measure B22.</p>	Yes	Protection of wintering birds during construction.	<p>Table 8.94 of EIAR Chapter 8 Biodiversity details the locations of 'important bird areas', what season the species was recorded in, and the seasonal restrictions in these areas.</p>	Compliance with specified avoidance periods for wintering bird populations.	Contractor(s)	Construction
B24	Chapter 8 (Biodiversity) Section 8.8	Ornithology-Wintering Birds	<p>Flight diverters/markers will be installed on the 38 kV Uprate Works over the Lower River Shannon (between Polesets 65B to 69B) and the Headrace (between 64B to 65B) to reduce collision risk for wintering birds.</p>	No	Protection of wintering birds during operation.	<p>Works will be undertaken by ESNB as part of the 38 kV Update Works.</p>	Flight diverters installed.	ESBN	Post-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
B25	Chapter 8 (Biodiversity) Section 8.8	Monitoring the biodiversity mitigation implemented	<p>Terrestrial habitats All KER habitats reinstated post-construction will be monitored to determine the overall success of the reinstatement process. The monitoring programme will require annual monitoring, for a minimum period of five years to confirm viable growth is occurring, to undertake remedial works if deemed necessary, and to determine any need to extend the monitoring.</p> <p>In relation to the translocation of rare/protected flora, monitoring will be carried out in the subsequent weeks following reinstatement and the onset of the growing season in the following spring, and again during the flowering period in June/July. The total number of individual plants will be recorded to monitor plant recovery over time to inform if translocation was successful.</p> <p>Bats Monitoring of newly planted hedgerows and treelines will be undertaken annually, for a minimum period of five years to confirm viable growth is occurring, and to undertake remedial works if deemed necessary. Summer surveying of important bat commuting routes and feeding areas will be undertaken annually over a period of five years by an experienced bat ecologist.</p> <p>The following monitoring will be undertaken by a qualified bat specialist:</p> <ul style="list-style-type: none"> • Monitoring of bat house within one year of construction and for a minimum of three years. • Register bat box scheme with Bat Conservation Ireland. Inspection and annual cleaning of bat boxes for at least two years. • A full summer bat survey will be undertaken post-works, over a period of five years. <p>Badgers Periodic monitoring and maintenance will be completed to ensure the long-term effectiveness of mammal-resistant fencing around the permanent infrastructure sites. Artificial setts, established in close proximity to existing setts, will be monitored quarterly for at least one year following the completion of construction works.</p> <p>Ornithology- Breeding Birds The nesting box for the loss of the barn owl breeding nest will be monitored annually for a period of five years following installation. Monitoring will assess occupancy, breeding activity, and any signs of disturbance, with findings used to inform any adaptive management measures, if required.</p>	Yes	Ensure the success of the implemented biodiversity mitigation.	N/A	Confirmation of: <ul style="list-style-type: none"> • Establishment of reinstated habitat • Successful translocation of rare /protected flora • Establishment and use of replanted bat corridors • Successful occupation of bat house • Successful use of bat boxes • Successful use of barn owl nest box 	Uisce Éireann	Construction Post-construction
B26	NIS	Lower River Shannon SAC	The Planning Application Boundary of the Proposed Project overlaps with the boundary of the Lower River Shannon SAC where the power connection for the WTP crosses the Kilmastulla River. No works will take place within the SAC at this location.	No	Avoid impacts within the SAC boundary at this location.	Area shown on Figure 3.2 of the NIS.	No works in boundary of the SAC.	Contractor	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
Water									
W1	CEMP – Annex A	Surface water management	<p>A Surface Water Management Plan (SWMP) will be implemented based on the SWMP in CEMP Annex A. The SWMP will be updated by the appointed Contractor in line with updates to the CEMP. The SWMP will detail any safeguards required for surface water protection and pollution control during construction and will be adhered to by the Contractor(s) at all times.</p> <p>ID numbers in the W-measures listed below refer to measures set out in the SWMP.</p>	Yes, as per the SWMP in CEMP Annex A	Surface water management and pollution prevention.	Each contractor will prepare a specific, targeted SWMP for their own section of the pipeline/works that complies with the SWMP in Annex A of the CEMP.	Implementation of the SWMP.	Contractor(s)	Pre-construction Construction
W2	Chapter 9 (Water) Appendix A9.2 (Pipeline Assessment) Appendix A9.3 (Infrastructure Sites Assessment)	Drainage and control of sediment	<p>Implementation of measures to control sediment run-off into watercourses from temporary working areas, including:</p> <p><u>Pipeline:</u></p> <ul style="list-style-type: none"> • Use of toe-drains along the construction working width (ID W-SC1) • Use of attenuation lagoons (ID W-SC2) • During reinstatement (ID W-SC8). <p><u>Infrastructure Sites:</u></p> <ul style="list-style-type: none"> • Managing silty water at the RWI&PS (ID W-SC22); WTP (ID W-SC28); BPT (ID W-SC31); BPS (ID W-SC33); FCV (ID W-SC35); TPR (ID W-SC-37) • Construction sequencing to include early installation of settlement tanks and minimising exposed earthworks (ID W-SC21 for RWI&PS; ID W-SC26 for the WTP; ID W-SC36 for the TPR) • Use of secant piling at the RWI&PS to reduce dewatering requirements (ID W-SC24) • Use of geotextile membranes overlain with stone at Construction Compounds (ID W-SC23 and ID W-SC29). 	Yes – see Section 7 of SWMP	No measurable impact on receiving surface waters.	Adherence to Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI 2016).	Implementation of the SWMP.	Contractor(s)	Construction
W3	Chapter 9 (Water) Appendix A9.2 (Pipeline Assessment) Appendix A5.3 (Methods of Working in Peat)	Working in peat	Implementation of measures when working in peat to protect receiving waters from pollution run-off, as set out in the SWMP (specific measures ID W-SC9 – ID W-SC15).	Yes – see Section 4.4 of SWMP	No measurable impact on receiving surface waters.	Standards set by the Environmental Protection Agency (EPA) for Bord na Móna Integrated Pollution Control licence also applicable to the Proposed Project.	Implementation of the SWMP.	Contractor(s)	Construction
W4	Chapter 9 (Water) Appendix A9.2 (Pipeline Assessment)	Watercourse crossings	<p>Implementation of proposed techniques for watercourse crossings as set out in the SWMP:</p> <ul style="list-style-type: none"> • Trenchless crossings (ID W-SC3) • Open cut crossings (ID W-SC4) • Over-pumping (ID W-SC5) • Fluming (ID W-SC6) • Open cut crossings in areas of peat (ID W-SC7) • Clear span bridging for 38 kV Uprate Works access (ID W-SC38) • Clear span bridging of the Kilmastulla river for the WTP access road (ID W-SC27). 	Yes – see Section 7 of SWMP	No measurable impact on receiving surface waters.	Adherence to Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI 2016).	Implementation of the SWMP.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
W5	Chapter 9 (Water) Appendix A9.2 (Pipeline Assessment)	Outfalls	Design and implementation of measures for construction of new pipeline washouts as set out in the SWMP (ID W-SC16). Post-construction inspections to monitor the efficacy of outfall design measures (ID W-SO4).	Yes – see Section 7 and 8 of SWMP	No measurable impact on receiving surface waters.	N/A	Implementation of the SWMP. Handover Environmental Management Plan once the Proposed Project is constructed and commissioned.	Contractor(s) Uisce Éireann	Pre-construction Construction Post-construction
W6	Chapter 9 (Water) Appendix A9.2 (Pipeline Assessment)	Culverting of watercourses (Construction Compounds and infrastructure sites)	Design and implementation of specific measures for culverting within Construction Compounds and Pipe Storage Depots (ID W-SC17). Post-construction appraisal of the efficacy of culverting measures (ID W-SO3).	Yes – see Section 7 and 8 of SWMP	No measurable impact on culverted watercourses.	N/A	Implementation of the SWMP. Handover Environmental Management Plan once the Proposed Project is constructed and commissioned.	Contractor(s) Uisce Éireann	Construction Post-construction
W7	Chapter 9 (Water) Appendix A9.2 (Pipeline Assessment)	Testing & commissioning	Agreement with EPA on abstraction of hydrostatic test water from eight identified source watercourses (ID W-SC18) – timing, duration, abstraction rates, methods of abstraction e.g. intake design. Agreement with Uisce Éireann on the timing and duration of abstractions from the Camcor and Liffey - need for temporary reduced abstractions for existing Uisce Éireann supplies (ID W-SC19). Selection of discharge locations, discharge methods, and appropriate treatment of test water prior to discharge (ID W-SC20).	Yes – watercourse quality and flows in advance of abstractions	No measurable impact on source waters and their uses.	None of the rivers proposed for abstraction are headwaters or salmonid spawning areas.	Implementation of the SWMP.	Uisce Éireann Contractor(s)	Pre-construction Construction
W8	Appendix A9.4 Flood Risk Assessment (FRA)	Flood risk management at temporary working areas	Implementation of flood control measures detailed in Section 6 of EIAR Appendix A9.4 (FRA).	Contractor early warning system	No increase in flood risk.	N/A	No flooding incidents.	Contractor(s)	Construction
Soils, Geology and Hydrogeology									
SG1	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5 CEMP – Annex B	Soil Management Plan	A Soil Management Plan (SMP) will be implemented based on the SMP in Annex B CEMP. The SMP will be updated by the appointed Contractor in line with updates to the CEMP. The SMP will detail any safeguards required for soils reuse, storage and transportation, and be adhered to at all times by the Contractor(s).	Yes, as per the SMP in CEMP Annex B	Management of soil resources.	Each contractor will prepare a specific, targeted SMP for their own section of the pipeline/works that complies with the SMP in Annex B of the CEMP.	Implementation of the SMP.	Contractor(s)	Pre-construction Construction
SG2	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Soil resource recording	During soil stripping, topsoil will be stripped across the required site area to its full depth, as determined by the Agronomist and Land Liaison Officers (LLO) to be engaged by Uisce Éireann, and records kept of the depths stripped in each parcel of land. See also REAC measure A7.	No	Management of soil resources.	Adherence to the SMP (REAC measure SG1). Input from Agronomist appointed by Uisce Éireann as required.	Implementation of SMP. Land use records for soil management.	Contractor(s) Uisce Éireann LLOs	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
SG3	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Soil compaction	Access for the 38 kV Uprate Works will be achieved using wide-tracked, low ground pressure vehicles to minimise damage in soft ground areas. In very wet land (saturated soils/high water table), bog mats (wooden, rubber) or aluminium road panels will be installed to mitigate any possible damage to the highly valued terrain in the vicinity of the proposed works. In very poor, soft, boggy and/or undulating land, stone roads may need to be constructed. In such instances geotextile reinforcement will be placed on the surface and stone placed on top and compacted to form the track. Silt fencing will be erected by fixing posts at intervals to act as a silt curtain along the edge of the trackway, if trackways are located within 20m from identified watercourses.	No	Prevent soil compaction during access to the sites of construction.	The public road network will be used in the first instance to gain access to the general vicinity of the proposed works. ESBN will endeavour to use existing farm entrances and tracks and/or track across farmland where land conditions are suitable.	Minimal landowner complaints.	ESBN	Construction
SG4	Appendix A5.3 (Methods of Working in Peat)	Working in peat	<p>Detailed methodologies for working in areas of peatland will be set out by the Contractor(s), based on EIAR Appendix A5.3 (Methods of Working in Peat). This will include methods for:</p> <ul style="list-style-type: none"> • Access along the Construction Working Width • Excavation (with reference to Methods 1-4 depending on depth of peat) • Addressing stability risks e.g. stepping or battering back of excavations to a safe angle; sheet piling; rock fill • Temporary storage of peat • Control of drainage (with reference to REAC measure W3) • Reinstatement of peat. <p>Method Statements will be produced for each of the Bord na Móna areas of peatland to be crossed and also for private peatland areas.</p>	Yes – monitoring of excavation and peat movement by a suitably qualified and experienced geotechnical engineer. Maintenance of a geotechnical risk register.	Minimise the impact of the Proposed Project on peat. No impact on Bord na Móna rehabilitation plans or enhanced Peatlands Climate Action Scheme (PCAS) rehabilitation schemes.	Liaison and coordination with Bord na Móna.	Approval of the Method Statements by Uisce Éireann appointed geotechnical engineer and by Bord na Móna.	Contractor(s) Uisce Éireann	Pre-construction Construction
SG5	Chapter 10 (Soils, Geology and Hydrogeology) Chapter 8 (Biodiversity) Appendix A5.3 (Methods of Working in Peat)	Working in peat	<p>Excavated peat will be retained within the Construction Working Width and reused as part of the reinstatement works. Where surplus peat occurs on the Bord na Móna sites, there is an agreement to retain peat on Bord na Móna lands.</p> <p>Peat will be reinstated as set out in EIAR Appendix A5.3 (Methods of Working in Peat) and will include additional measures in areas of degraded raised bog, including drain blocking, ditch reprofiling, and removing any scrubs/trees and/or ground smoothing.</p>	Yes – monitoring of excavation and peat movement by a suitably qualified and experienced geotechnical engineer. Maintenance of a geotechnical risk register. Groundwater level monitoring on boundaries.	Minimise the impact of the Proposed Project on peat. No impact on Bord na Móna PCAS rehabilitation schemes.	Liaison and coordination with Bord na Móna.	Approval of the Method Statements by Uisce Éireann appointed geotechnical engineer and by Bord na Móna. Maintaining water levels in peat post construction.	Contractor(s) Uisce Éireann	Pre-construction Construction Post-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
SG6	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Geological Heritage Sites	<p>The following measures apply to the Kilmastulla Meltwater Channel, Ardrony Esker, Kilcormac Esker and Kinnitty Esker County Geological Sites:</p> <ul style="list-style-type: none"> Continued consultation with the Geological Survey Ireland (GSI) Ground investigation (GI) data to be provided to GSI to aid in the delineation and characterisation of the County Geological Site Limiting excavation by only excavating the required footprint Limiting construction in the Kilmastulla River Channel The GSI will be notified by the appointed Contractor(s) about any significant new section/feature that is exposed within the construction footprint. 	No	Prevent damage to Geological Heritage Sites during the construction.	N/A	GSI approval.	Contractor(s)	Construction
SG7	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5 Chapter 6 (Noise and Vibration) Section 6.5	Geomorphology and geohazards: Fort Henry Embankment	<p>During site preparation works, the reserved area near the Fort Henry Embankment, which ESB have requested be excluded from temporary or permanent works, will be permanently fenced off.</p> <p>A monitoring plan for the works will be prepared and implemented, to include:</p> <ul style="list-style-type: none"> A monitoring regime will be agreed between Uisce Éireann and ESB. This will include installing piezometers to monitor groundwater and ground movement/stability monitoring. These will be connected individually to a modem logger to allow data to be transferred over a mobile phone network to a shared platform for relevant stakeholders Ground movement and slope stability monitoring and vibration monitoring Monitoring will be in accordance with the Dam Surveillance Guide (International Commission on Large Dams 2018). Performance monitoring will be carried out regularly by qualified geotechnical professionals. 	Yes, by a suitably qualified and experienced geotechnical engineer	To mitigate potential geohazards arising from operation of the RWI&PS.	Will include ongoing risk analysis. These measures will be incorporated into a specific risk management method statement for the embankment and will be embedded into the contract documents.	ESB approval.	Contractor(s) Uisce Éireann	Pre-construction Construction Operation
SG8	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Geomorphology and geohazards: karst features	<p>A karst protocol will be employed during construction involving a series of steps and methodologies to ensure stability in karst areas. Geotechnical risk assessment to be completed in the event of any voids or karst features being encountered during construction.</p> <p>Where weathered limestone or karst is encountered at formation level, the feature will be mapped in detail. Each feature and associated mitigation measure will be documented and included in the safety file for the Proposed Project.</p> <p>Ground stabilisation measures to be employed will include compaction, grouting/stabilisation, geotextile or utilising raft foundations.</p> <p>The stabilisation measures will be approved by a geotechnical engineer. Where infilling or grouting is undertaken (such as proposed at the BPT), works will be supervised by a suitably qualified hydrogeologist to ensure there is no effect on groundwater.</p>	Yes, by a suitably qualified and experienced geotechnical engineer and hydrogeologist	No instability issues arising from karst features during construction or post-construction.	Karst feature inspection protocol as documented in: Madden and Hara (2016) The Treatment of Karst Features Encountered during Road Construction in County Galway.	Geotechnical risk assessments completed.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
SG9	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Hydrogeology: dewatering of excavations	<p>Dewatering will be undertaken in accordance with C750 Groundwater Control: Design and Practice second edition (CIRIA 2016). Mitigation measures will include:</p> <ul style="list-style-type: none"> Limiting the period of open excavations and therefore dewatering requirement Suitable groundwater control scheme to minimise drawdown or pore water pressure reductions, i.e. sheet or secant piles With reference to REAC measure W2, discharge of water will be managed in accordance with the SWMP Monitoring of existing water supplies (private wells; Public Water Schemes, Group Water Schemes) potentially affected (see REAC measure SG12), and if necessary, replacement or augmentation of affected water supplies. 	Yes, as per REAC measure SG12 and the SWMP (CEMP Annex A)	No impact on groundwater receptors.	<p>EIAR has determined:</p> <ul style="list-style-type: none"> No significant dewatering required at the WTP, BPT, BPS, FCV, TPR Secant piling proposed at RWI&PS For the majority of the pipeline route, limited drawdown due to relatively shallow excavations. 	Implementation of the SWMP. Monitoring records.	Contractor(s)	Construction
SG10	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Hydrogeology: Group Water Schemes (GWS) and Public Water Schemes (PWS)	<p>In order to reduce the potential for groundwater level impacts on the Ballinagar GWS and Geashill PWS, pipeline construction works in the potential drawdown zones will be limited in duration (less than 12 weeks), and groundwater monitoring will be undertaken upgradient of these supplies. Alternative water sources will be identified e.g. tankering, as a contingency should the need arise.</p>	Yes	No impact on existing water supplies.	<p>Pipeline located:</p> <ul style="list-style-type: none"> 150m downgradient of the Ballinagar GWS 350m downgradient of the Geashill PWS. 	Monitoring records.	Contractor(s)	Construction
SG11	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Hydrogeology: Groundwater dependent terrestrial ecosystems (GWDTE)	<p>Along sections of the Treated Water Pipeline, at species-rich grasslands/wetlands, sensitive wetlands, peatlands or on steep gradients, puddle clay stanks or low permeability material will be used as an impermeable barrier to the free movement of water along the pipeline trench.</p>	No	No impact on GWDTEs.	Locations are shown on the Environmental Masterplan (EIAR Figures 4.106 to 4.184).	No visual impacts on GWDTE.	Contractor(s)	Construction
SG12	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Hydrogeology: groundwater monitoring	<p>A detailed groundwater monitoring schedule will be prepared, to include:</p> <ul style="list-style-type: none"> Groundwater level monitoring at the Fort Henry embankment, private wells within 100m of the pipeline; potentially affected PWS and GWS, and Bord na Móna PCAS peat rehabilitation schemes Groundwater quality at potentially affected PWS, GWS and private wells. 	Yes	Detection of impacts and need for remedial measures.	Table 10.32 in EIAR Chapter 10 Groundwater Monitoring Schedule.	Monitoring records.	Contractor(s) Uisce Éireann	Pre-construction Construction Operation
SG13	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Soil contamination – Construction Phase	<p>Where contaminated soils/materials are discovered during construction, these areas of ground will be isolated, tested for contamination, and pending the results of laboratory testing, will be excavated and exported off-site to a permitted/licensed waste facility.</p>	Yes – visual/olfactory watching brief to determine need for chemical testing.	Prevent impacts from contaminated land.	No significant potential contamination risk identified in the EIAR.	Testing results.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
SG14	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Soil contamination – trenchless crossings	<p>Measures to mitigate potential ground impacts associated with trenchless crossing/directional drilling will include:</p> <ul style="list-style-type: none"> The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e. Clear Bore Drilling Fluid or similar will be used) Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered The area around the bentonite batching, pumping and recycling plant will be bunded using Terram geotextile (as it will clog) and sandbags in order to contain any spillages Drilling fluid returns will be contained within a sealed tank/sump to prevent migration from the works area Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized skip before being taken off-site Any sediment-laden water from the works area will not be discharged directly to the ground or surface waters Daily monitoring of the compound works area, the water treatment and pumping system will be completed by a suitably qualified person during the Construction Phase. All necessary preventative measures will be implemented to ensure no entrained sediment or deleterious matter is discharged On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated at the earliest opportunity to prevent soil erosion The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology. This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur, then drilling will be immediately stopped Any drilling fluid material will be contained and removed off-site The drilling location will be reviewed before recommencing with a higher viscosity drilling fluid mix Spent bentonite drilling fluid will require reuse or disposal at the end of the tunnelling process. If an alternative use for this material is not identified, it will be disposed of in an appropriately licensed waste facility (see REAC measure RW3). 	Yes	No impacts to watercourses and groundwater at trenchless crossings.	N/A	Monitoring records. No lost bentonite; records for disposal of spent bentonite.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
SG15	Chapter 10 (Soils, Geology and Hydrogeology) Section 10.5	Soil contamination – Operational Phase	<p>The following points are to be adhered to by Operator(s) of the Proposed Project:</p> <ul style="list-style-type: none"> Chemicals will be stored in compliance with the handling instructions provided with the Material Safety Data sheets (MSDS) and in compliance with the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (as amended) and the Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended). This includes separation of incompatible chemicals, provision of adequate fire-fighting equipment, spill containment and other safety facilities. For each chemical, an MSDS will be available, as well as an assessment of the hazards associated with the chemical (to personnel, for storage and for emergency response). The MSDSs will be available at the various places where chemicals are required to be used and centralised with the Safety Officer on board. Chemicals will be stored in drums or smaller containers and be suitably banded to contain any leaks or spills. The design of reinforced concrete structures will be water-retaining and the use of bunds around any chemicals and oil storage areas will reduce the risk of any leaks or accidental spillages. 	No	Ensure there is no soil contamination arising from the operation of the Proposed Project.	N/A	Handover Environmental Management Plan once the Proposed Project is constructed and commissioned.	Uisce Éireann	Operation
Agriculture									
A1	Chapter 11 (Agriculture) Section 11.5	Responsibility of Land Liaison Officers (LLOs) during construction	<p>LLOs appointed by Uisce Éireann will be in place throughout the construction, reinstatement and handover phases to provide the principal point of contact with affected landowners and be the interface between Uisce Éireann and the appointed Contractor(s). LLO responsibilities will include:</p> <ul style="list-style-type: none"> Maintain communication with landowners at all times during all aspects of the works, keeping landowners fully informed of any issues raised Facilitate the reorganisation of farm enterprises at critical times during the Construction Phase Consult with landowners to identify any special management requirements such as specific on farm biosecurity measures, isolating and identifying the disease status of farms affected. <p>Landowners will be informed of the name, address and telephone number of the LLO contact to whom queries should be addressed.</p>	No	Ensure effective communication with landowners during construction.	N/A	Minimal complaints from affected landowners.	Uisce Éireann Contractor(s)	Pre-construction Construction Post-construction
A2	Chapter 11 (Agriculture), Section 11.5	Protection of sensitive and valuable stock	<p>On holdings where sensitive or specialised livestock are present, such as high-value or performance equine enterprises, additional precautions may be necessary. Where practicable, animals may be temporarily relocated away from areas subject to high construction activity. Alternatively, the temporary placement of excavated material in the form of a soil bund may be used to provide both a visual and acoustic buffer between construction activities and livestock.</p>	No	Preventing harm to sensitive and valuable stock during construction.	EIAR Appendix A11.2, Appendix A11.3 and Appendix A11.5 detail the proposed mitigation measures for each of the agricultural holdings, including for livestock/equine operations.	Agreement with landowners on livestock protection measures.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
A3	Chapter 11 (Agriculture), Section 11.5	Timing and scheduling of works	<p>Construction and farming activities may be scheduled to coincide with cropping cycles, i.e. in fallow periods where practicable. The appointed Contractor(s) will be required, wherever practicable, to carry out the main pipeline activities in the period 1 March to 30 November and will use all reasonable attempts to plan the construction programme in order to comply with this timescale.</p> <p>Individual landholders will be given the maximum possible notice in advance of construction works. The works will, in so far as possible, be carried out in accordance with a programme of which the landowner will be kept informed, enabling them to plan farming activities and minimise disruption.</p>	No	Minimise disruption caused by construction.	N/A	Agreement with landowners on timing and scheduling of works.	Contractor(s)	Construction
A4	Chapter 11 (Agriculture), Section 11.5	Access for agriculture during construction	<p>Construction activities will be confined to the Planning Application Boundary. The Construction Working Width will be fenced off (with a stock-proof fence) during the Construction Phase. The type of fencing will be agreed in consultation with landowners. Temporary access points will be provided and the location and number of crossing points discussed and agreed with landowners.</p> <p>A Pre-entry Requirements and Record of Construction Report will be completed with the landowner/occupier prior to the appointed Contractor(s) entering onto the land for the main pipeline construction. The report will contain landowners' particular reasonable requests in relation to temporary fencing, the provision of access across the Construction Working Width, the provision of water supply and power supply. Landowners will be notified prior to access being required to allow stock to be moved.</p>	No	Ensure access to agricultural land is not compromised during construction.	EIAR Appendix A11.2, Appendix A11.3 and Appendix A11.5 detail the proposed mitigation measures for each of the agricultural holdings, including required access arrangements.	Completed Pre-entry Requirements and Record of Construction Report. Landowner agreement to access arrangements.	Uisce Éireann Contractor(s)	Pre-construction Construction
A5	Chapter 11 (Agriculture), Section 11.5	Impacts on water and electricity supplies	<p>If existing water and electricity supplies are disrupted during the Construction Phase, an alternative water source and electricity supply will be made available such as water tanker or electric cable ducting. If permanent access to surface drinking water sources is disrupted, alternative groundwater supplies will be provided (or compensation will be provided to allow farmers to drill their own wells).</p>	No	Prevent disruption to drinking water and electricity supplies during construction.	REAC Measure SG9 provides for monitoring of private wells and public water supplies and provision of replacement supplies if required.	Maintained provision of water and electricity services.	Contractor(s)	Construction
A6	Chapter 11 (Agriculture), Section 11.5	Biosecurity during construction	<p>Further to REAC measure Biodiversity B5: <i>the development and implementation of the Invasive Species and Biosecurity Management Plan (ISBMP) in the CEMP</i>, disease protocols and farm biosecurity measures will be implemented as part of normal construction management procedures to protect and prevent the spread of pests and diseases. The appointed Contractor(s) will comply with the Department of Agriculture Food and Marine's regulations in relation to crops and livestock diseases. Stock-proof boundaries will be maintained to prevent animals straying and mixing with other livestock. In the event that a notifiable disease outbreak occurs, or specific national biosecurity measures are introduced, any additional requirements will be implemented as directed by the relevant authorities, in coordination with affected landholders and stakeholders.</p> <p>Controls will be in place to ensure that machinery can move freely within defined working corridors without facilitating the transfer of soil material between landholdings. Specifically, soil excavated from one landholding will not be transported to another, and care will be taken to avoid introducing external soil onto individual holdings.</p>	Yes, as per ISMP in CEMP Annex F	Implement effective biosecurity during construction.	Each contractor will prepare a specific, targeted ISMP for their own section of the pipeline/works that complies with the ISMP in Annex F of the CEMP.	Compliance with ISMP and Department of Agriculture Food and Marine Regulations.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
A7	Chapter 11 (Agriculture), Section 11.5	Topsoil stripping and soil management	Soil cleared from land parcels will be stockpiled and protected during construction to prevent subsoil and topsoil mixing. The stockpiled soil will be re-used during reinstatement. LLOs will be present on-site to monitor the stripping, handling, and storage of topsoil, and to record land use details for each affected holding.	No	Protection of soil resources	Adherence to the Soil Management Plan (REAC measure SG1). Input from Agronomist appointed by Uisce Éireann as required.	Implementation of Soil Management Plan. Land use records for soil management.	Contractor(s) Uisce Éireann LLOs	Pre-construction Construction
A8	Chapter 11 (Agriculture), Section 11.5	Reinstatement following construction	All agricultural lands will be reinstated to pre-construction conditions. Reinstatement of soils will be undertaken as set out in the Soils Management Plan (REAC measure SG1), noting that works will only be carried out during periods of appropriate weather conditions and not during periods of persistent rainfall when works could damage soils. Any shelterbelts (trees and hedgerows) removed during the Construction Phase will be reinstated post-construction to restore shelter provision and field boundary structure, in line with REAC measure B2.	No	Ensure effective reinstatement of agricultural land following construction.	Adherence to the Soil Management Plan (REAC measure SG1).	The level of the trench area shall be the same as that of the surrounding ground, around one year after restoration is completed.	Contractor(s) Uisce Éireann	Post-construction
A9	Chapter 11 (Agriculture), Section 11.5	Land drainage systems	Pre-construction liaison meetings with landowners will be held to agree the extent of existing land drainage systems that will be impacted by the Construction Phase and to agree the nature and extent of replacement drains required. A detailed record of the locations of land drains intercepted during construction will be kept. A LLO will be on-site to record land details. This process will also be followed during reinstatement works. In instances where existing land drainage systems are affected, equivalent drainage systems will be reinstated to maintain existing functionality and prevent any long-term impacts on land usability.	No	Ensure there is no long term disruption of agricultural drainage systems as a result of construction.	N/A	Pre-construction land drainage records. Landowner agreement on reinstated land drainage plans.	Contractor(s) Uisce Éireann LLOs	Pre-construction Construction Post-construction
A10	Chapter 11 (Agriculture), Section 11.5	Intensive equine enterprise specific mitigation	At one location, the Proposed Project directly intersects with an equine training gallop. The gallop will be unavailable during haul road construction, pipeline installation, and reinstatement. Outside these periods, it will be kept operational through management practices comparable to those employed at racetracks (e.g. Leopardstown, Aintree). A suitable fibre/sand surface will be laid across the haul route when the gallop is in use, removed during haul traffic, and reinstated/levelled for galloping. No construction activity will take place while horses are using the gallop. To mitigate potential stress caused by noise and visual disturbance, the landowner will receive a minimum advance notice prior to construction works commencement. This will allow sufficient time to relocate bloodstock to alternative pastures. Access to severed lands will be maintained throughout the construction period. Noise and Visual Screening: Berms of excavated soils will be strategically placed within the wayleave corridor (east, west, or north of the trench, depending on location) to provide supplementary screening. In addition at specific locations, temporary noise and visual barriers (approximately 3 m high and constructed from materials sympathetic to the surrounding environment) could be installed.	No	Minimise disruption caused by construction.	EIAR Appendix A11.2 details the proposed mitigation measures for each of the agricultural holdings (including intensive equine enterprises).	Agreement with landowners on implementation of mitigation.	Contractor(s) Uisce Éireann LLOs	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
A11	Chapter 11 (Agriculture), Section 11.5	Operational Phase monitoring of agricultural land	<p>Routine inspections and periodic maintenance activities will be undertaken during the Operational Phase. These will be planned and coordinated with landowners to minimise disruption. All biosecurity and disease control protocols will continue to be observed. These activities are expected to be infrequent and short in duration.</p> <p>Continued monitoring for noxious weeds and invasive species will be undertaken during routine maintenance inspections, and appropriate control measures will be implemented as required.</p>	No	Minimise disruption to farming practices during operation.	Notification will be provided in advance of such works to allow landowners to adjust farming activities and relocate livestock where necessary. All biosecurity and disease control protocols will be observed.	Landowner agreement. Completed inspections.	Uisce Éireann	Operation
A12	Chapter 11 (Agriculture), Section 11.5	Management of Washout Valve operations	Rare discharge events from Washout Valves during operation will be carefully managed to reduce disruption to agricultural land. Prior to any planned discharge, excluding emergency scenarios, landholders of affected agricultural parcels will be notified in advance to allow time for adjustments to farm operations. Site-specific conditions, including soil type, topography, and existing field boundaries, will be reviewed to inform the most appropriate discharge management approach. Where required, temporary measures such as discharge dispersion or flow control, will be employed to avoid prolonged surface saturation.	Yes - In the event of unplanned discharge, post-event inspections will be undertaken to assess any impacts to agricultural use, and appropriate remedial actions will be agreed with the landholder if necessary.	Reduce disruption to agricultural land	Notification will be provided in advance of such works to allow landowners to adjust farming activities.	Agreement with landowners on timing and scheduling of works.	Uisce Éireann	Operation
A13	Chapter 11 (Agriculture), Section 11.5	Equine enterprise operational mitigation	Treatment of permanent above-ground features such as washout valves, air valves, manways, outfalls and electricity poles so that these structures will be fenced off in accordance with equine industry standards to ensure safety for grazing and exercising horses.	No	Minimise disruption to farming practices during operation.	Landowners to be consulted on design.	Incorporating such features into existing boundary lines where feasible, or extending fencing across paddock boundaries where necessary, to eliminate the risk of collision or entrapment.	Uisce Éireann	Operation
Air Quality									
AQ1	Chapter 12 (Air Quality) Section 12.5	Traffic emission mitigation measures	<p>The contractor will implement and adhere to good practice measures to reduce vehicle emissions as far as practicable, including:</p> <ul style="list-style-type: none"> • Implement a policy which prevents idling of vehicles both on and off site, including Heavy Duty Vehicle holding sites • Efficient scheduling of deliveries to reduce trips as far as practicable • Construction vehicles shall conform to the current EU emissions standards and where reasonably practicable, their emissions shall meet upcoming standards prior to the legal requirement date for the new standard. 	No	Reduce construction vehicle emissions.	N/A	Contractor shall implement and monitor policy for idling vehicles, monitor materials scheduling and provide vehicles which comply to current EU emissions standards.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
AQ2	Chapter 12 (Air Quality) Section 12.5 CEMP – Annex E	Construction dust mitigation measures	<p>The contractor will prepare a Dust Management Plan for all construction activities using the mitigation measures presented in EIAR Appendix A12.1 (Dust Mitigation Measures) and CEMP Annex E.</p> <p>The Dust Management Plan prepared by the Contractor must include all appropriate dust and emissions mitigation measures, including for asbestos and aspergillus (in particular for Peamount Hospital), applicable to the circumstances of the relevant site, based on the local authority requirements and industry good practices.</p> <p>The Dust Management Plan will be updated by the appointed Contractor, and for each worksite shall include:</p> <ul style="list-style-type: none"> • An inventory and timetable of activities which may give rise to emissions or dust • Alert levels • Alert system to be used (including notification process) • Details of control measures • Details of dust-monitoring arrangements, including the location of sensitive receptors, monitoring locations and monitoring equipment to be used • Details of the air quality reporting requirements. 	Yes, as per the Dust Management Plan in CEMP Annex E	Reduce construction dust from general construction.	<p>Requirements of EIAR Appendix A12.1 and CEMP Annex E are implemented.</p> <p>Each contractor will prepare a specific, targeted Dust Management Plan for their own section of the pipeline/works that complies with the Dust Management Plan in Annex E of the CEMP.</p>	Implementation of the Dust Management Plan.	Contractor(s)	Pre-construction Construction
AQ3	Chapter 12 (Air Quality) Section 12.5 CEMP – Annex E	Peamount Hospital Construction Compound specific mitigation	<p>The National Guidelines for the Prevention of Nosocomial Invasive Aspergilliosis during Construction /Renovation Activities (National Disease Surveillance Centre 2002) and National Guidelines for the Prevention of Nosocomial Aspergilliosis (HSE 2018) will be complied with by the appointed Contractor.</p> <p>Aspergillus survey and prevention works are to take place before construction commences. Specifically:</p> <ul style="list-style-type: none"> • Employ a suitability qualified specialist to complete aspergillus works around Peamount Hospital • Prevention works will involve advising that the windows on the façades of the hospital that are in closest proximity to the works are sealed where feasible to limit dust entering the hospital through windows (in line with the National Guidelines for the Prevention of Nosocomial Aspergilliosis) • An Aspergillus Prevention Plan will be developed by a suitably qualified specialist prior to commencement of works on the site to prevent Aspergillus spores spreading • The National Guidelines for the Prevention of Nosocomial Invasive Aspergilliosis will be taken into consideration by the competent contractor as a source for the Aspergillus Prevention Plan. 	Yes, as per the Dust Management Plan in CEMP Annex E	Prevention spread of Aspergillus.	Contractor provides specialist contractor including their appropriate licences and insurances to the client at contract acceptance stage and agrees contents of Aspergillus Prevention Plan prior to commencement of construction.	Implementation of the Dust Management Plan (including Aspergillus Prevention Plan).	Contractor(s)	Pre-construction
AQ4	Chapter 12 (Air Quality) Section 12.5 CEMP – Annex E	Peamount Hospital Construction Dust Monitoring Measures	At Peamount Hospital, a real-time particulate monitor to monitor PM ₁₀ and PM _{2.5} concentrations will be used. This monitor has the capability to provide alerts if particulate concentrations are elevated above set trigger levels.	Yes - real-time particulate monitoring	Measure the successfulness of dust mitigation measures.	Assume Dust Management Plan measures are in place.	Real time monitoring is implemented.	Contractor(s)	Pre-construction Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
AQ5	Chapter 12 (Air Quality) Section 12.5 CEMP – Annex E	Drummond Construction Compound Specific Mitigation	In addition to general dust management measures: <ul style="list-style-type: none"> Bound surface construction roads will be installed alongside the boundary between the Proposed Project, Drummond Compound and Monaghan Mushrooms. The Drummond Compound area will be hard surfaced (using tarmac). These will be regularly damped down with fixed or mobile sprinkler systems and regularly cleaned Any grassed areas on site will be kept mown short A mowing schedule will be implemented by the contractor which will include for weekly mowing of grassed areas on site during the growing season (spring/summer). The frequency of mowing will be reviewed by the contractor at regular intervals (minimum monthly) and tailored as necessary. Additional real-time particulate matter monitoring of fine particulate matter (PM₁₀ and PM_{2.5}) will be undertaken at one no. location along the northern boundary of the site. 	Yes - real-time particulate monitoring	Surfaces - Reduce and measure dust generation from Drummond Construction Compound. Mowing grass - Prevent flies (which are a disease vector for the adjoining highly sensitive horticultural operations). Monitoring - Ability to respond to short-term dust events.	Assume Dust Management Plan measures are in place.	Bound surface in place in advance of use of Construction Compound. Monitoring in place in advance of construction. Implementation of general dust management procedures.	Contractor(s)	Pre construction Construction
Climate									
C1	Chapter 13 (Climate) Section 13.5, Table 13.30	Carbon Management plan	Implement a whole life Carbon Management Plan aligned to PAS2080 to inform detailed design, build and operation.	Yes	To manage carbon through the lifecycle of the Proposed Project.	N/A	Implementation of Carbon Management Plan.	Contractor(s) Uisce Éireann	Pre construction Construction Operation
C2	Chapter 13 (Climate) Section 13.5, Table 13.30	Embodied Carbon Mitigation Measures	Concrete containing Portland cement will be replaced, where feasible, with a low carbon concrete as per the Carbon Action Plan (CAP25).	Yes, as part of Carbon Management Plan	Reduce embodied carbon in concrete structures and exceed the 30% minimum replacement required by public bodies.	An example of a replacement material is 50% ground granulated blast furnace slag although other options also apply and, provided they have an embodied carbon that is as low, or lower, then they are suitable for the final design with respect to the carbon assessment.	Implementation of Carbon Management Plan.	Contractor(s)	Construction
C3	Chapter 13 (Climate) Section 13.5, Table 13.30	Material procurement	Uisce Éireann will only procure from suppliers in Ireland that meet the industry reduction requirements within the CAP25 for 10% reduction in embodied carbon by 2025 and 30% reduction in embodied carbon by 2030. Where materials are procured outside of Ireland, embodied carbon will be considered as a primary component as part of the tender process. Both the Public Sector Mandate and the Green Public Procurement Strategy will be followed.	Yes, as part of Carbon Management Plan	Suppliers to meet their CAP targets.	Contractor will keep track of embodied carbon through carbon management.	Implementation of Carbon Management Plan.	Contractor(s)	Pre-construction Construction
C4	Chapter 13 (Climate) Section 13.5, Table 13.30	Operational power source	A Corporate Power Purchase Agreement (CPPA) will be in place to use electricity generated from renewables for 100% of operational electrical power.	Yes, as part of Carbon Management Plan	Use of renewable electricity during Operational Phase.	N/A	CPPAs in place.	Uisce Éireann	Operation
C5	Chapter 13 (Climate) Section 13.5, Table 13.30	Project fuel use	Sustainably sourced Hydrotreated Vegetable Oil (HVO) will be used in construction plant and equipment as a 100% replacement of fossil fuels, where available.	Yes, as part of Carbon Management Plan	Reduce carbon from fuel use.	HVO use is considered a stepping stone towards the use of electric construction plant as they become available in the market.	Implementation of Carbon Management Plan.	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
C6	Chapter 13 (Climate) Section 13.5, Table 13.30	Main Construction Compound power source	Main Construction Compounds will be connected to the electrical grid, via a supplier that can demonstrate renewable origins, rather than use of fossil fuel generators.	Yes, as part of Carbon Management Plan	Use of renewable electricity during Construction Phase.	Suppliers to be committed to maximising energy produced from renewable sources.	Implementation of Carbon Management Plan.	Contractor(s)	Construction
C7	Chapter 13 (Climate) Section 13.5, Table 13.30	Maintenance of plant and machinery	All plant and machinery will be maintained and serviced regularly.	No	To remove the likelihood of carbon emissions from inefficient machinery and plant.	All plant and machinery will be maintained as a matter of course.	The contractor shall make service logs available for inspection during audit activities.	Contractor(s)	Construction
C8	Chapter 13 (Climate) Section 13.5	Management of the Project's vulnerability to climate change	The Contractor will mitigate against the effects of extreme wind/storms and temperature extremes, through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures.	No	Effectively manage the risk of climate change to the Proposed Project.	N/A	Implementation of method statements.	Contractor(s)	Pre-construction/ Construction
C9	Chapter 13 (Climate) Section 13.5, Table 13.30	Operational power source	A Corporate Power Purchase Agreement (CPPA) will be in place to use electricity generated from renewables for operational electrical power.	Yes, as part of Carbon Management Plan	Use of renewable electricity during Operational Phase.	N/A	CPPAs in place.	Uisce Éireann	Operation
C10	Chapter 13 (Climate) Section 13.5	Operational phase climate mitigation for the project	The following measures will be implemented by Uisce Éireann during operation of the Proposed Project: <ul style="list-style-type: none"> Nearly zero-energy buildings Implement Green Public Procurement, using the EPA Green Public Procurement Guidance and criteria and Office of Government Procurement's online Green Public Procurement Criteria Search tool as resources Public sector procurement contracts for delivery and haulage should specify zero-emissions vehicles where practicable The Proposed Project comply with the Revised Energy Performance of Buildings Directive (EU/2024/1275). 	No	Reduce impacts on climate during operation of the Proposed Project.	Align the Proposed Project with CAP25 and the national climate target of a trajectory to net zero by 2050.	Implementation of Carbon Management Plan.	Uisce Éireann	Operation
C11	Chapter 13 (Climate) Section 13.5	Operational Phase travel and transportation	The following measures will be implemented by Uisce Éireann during operation of the Proposed Project: <ul style="list-style-type: none"> Promote the use of bicycles (including push bikes, electric bikes, and cargo bikes) and shared mobility options as an alternative to car use among employees and visitors by creating and maintaining facilities (both inside and outside buildings) that support such options, including secure and accessible bicycle parking, shared mobility parking, and charging stations, as appropriate, with a view to achieving the National Transport Authority's Smarter Travel Mark Phase out the use of parking in buildings that have access to a range of public transport services and active/shared mobility options for the majority of staff/visitors, while providing that sufficient accessible parking is maintained for those with physical mobility issues Procure (purchase or lease) only zero-emission vehicles and act as an international leader in this area. An exception applies where the vehicle is exempt under European Communities (Clean and Energy-Efficient Road Transport Vehicles) (Amendment) Regulations (S.I. 381 of 2021). 	No	Drive sustainable methods of travel during the running of the Proposed Project.	Align the Proposed Project with CAP25 and the national climate target of a trajectory to net zero by 2050. While it is noted that many of the sites are rural in nature and cycle to work may not be as feasible as within urban areas, the facilitation and promotion will aim to ensure it is utilised by anyone whom it is feasible for.	Implementation of Carbon Management Plan.	Uisce Éireann	Operation

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
C12	Chapter 13 (Climate) Section 13.5	Operational Phase training of staff	The following measures will be implemented by Uisce Éireann during operation of the Proposed Project: <ul style="list-style-type: none"> Incorporate appropriate climate action and sustainability training (technical and behavioural, including green procurement training) into learning and development strategies for staff Require all senior management to complete a climate action leadership training course. 	No	Promote sustainable practices in day-to-day running of project infrastructure.	Align the Proposed Project with CAP25 and the national climate target of a trajectory to net zero by 2050.	Implementation of Carbon Management Plan.	Uisce Éireann	Operation
Population									
P1	Chapter 14: Population, Section 14.5	Good practice mitigation	No specific mitigation measures are required for Population. Mitigation and general good practice measures outlined in the CEMP, and specific measures outlined for other topics in the REAC, will be adhered to by the appointed Contractor(s).	Yes, as outlined in the CEMP	To minimise environmental impact on sensitive communities during construction.	REAC measures to be implemented for Noise & Vibration; Air Quality; Traffic & Transport.	Minimal substantiated complaints received.	Contractor(s)	Pre-construction Construction
Human Health									
HH1	Chapter 15: Human Health, Section 15.5	Good practice mitigation	No specific mitigation measures are required for Human Health. Mitigation and general good practice measures outlined in the CEMP, and specific measures outlined for other topics in the REAC, will be adhered to by the appointed Contractor(s).	Yes, as outlined in the CEMP	To minimise health and welfare impacts on sensitive communities during construction.	REAC measures to be implemented for Noise & Vibration; Air Quality; Traffic & Transport; Agriculture; Geology & Soils; Water.	Minimal substantiated complaints received	Contractor(s)	Pre-construction Construction
Landscape & Visual									
LV1	Chapter 16: Landscape and Visual, Section 16.5	Landscape and Visual: Landscape Plans	For all infrastructure sites, the Contractor(s) will adhere to the appropriate landscape mitigation plan (Figures 4.89 to 4.99 Landscape Plans).	No	Prevention of significant landscape and visual effects.	N/A	Implementation of landscape mitigation plans.	Contractor(s)	Construction
Cultural Heritage									
CH1	Chapter 17: Cultural Heritage, Section 17.5	Project Archaeologist	A Project Archaeologist will be appointed for the Proposed Project.	No	Ensure that all mitigation measures are carried out to the full and to ensure the effectiveness of the measures.	N/A	Project Archaeologist appointed.	Contractor(s)	Pre-construction Construction
CH2	Chapter 17: Cultural Heritage, Section 17.5	Archaeological assessments	Archaeological underwater/wade assessments and archaeological testing programmes will be carried out at locations specified within the following sections of Chapter 17 of the EIAR (Sections 17.5.2.1 to 17.5.2.9) and associated tables (Tables 17.150 to 17.182). All archaeological underwater/wade assessments and archaeological testing programmes will be carried out in advance of construction and under licence to the Department of Housing, Local Government and Heritage (DoHLGH). The results of the assessments may lead to additional testing and recording, such as archaeological excavation (preservation by record) and/or monitoring.	No	Prevention or reduction of significant adverse effects on cultural heritage assets. Identification of any unknown heritage assets in the construction working areas.	Any further testing and recording will require the agreement of the National Monuments Service (NMS) of the DoHLGH.	NMS approval	Contractor(s)	Pre-construction
CH3	Chapter 17: Cultural Heritage, Section 17.5	Recording of archaeological features	Any required written and photographic records will be carried out prior to the construction of the Proposed Project, by a suitably qualified heritage specialist.	No	Ensure adequate recording of cultural heritage assets.	N/A	NMS approval	Contractor(s)	Pre-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
CH4	Chapter 17: Cultural Heritage, Section 17.5	Monitoring for archaeological features	Archaeological monitoring will be carried out during the construction of the Proposed Project at locations specified within the following sections of Chapter 17 of the EIAR (Sections 17.5.2.1 to 17.5.2.9) and associated tables (Tables 17.150 to 17.182) and across all greenfield areas of the Proposed Project (that are not first assessed by archaeological testing). Monitoring may lead to additional testing and recording, such as archaeological excavation (preservation by record).	Yes – monitoring by Project Archaeologist	Prevention or reduction of significant adverse effects on cultural heritage assets.	Any further testing and recording will require the agreement of the NMS of the DoHLGH.	NMS approval	Contractor(s)	Construction
CH5	Chapter 17: Cultural Heritage, Section 17.5	Monitoring for archaeological features in bogland	All removal of peat within former areas of commercial bogland will be subject to archaeological monitoring by an archaeologist with specific bogland experience. Prior to construction, a detailed walkover of the bogland will be carried out in order to identify any specific features/deposits of archaeological potential. Works will be carried out in advance of the laying of the Treated Water Pipeline from the BPT to the TPR, in order to ensure that time exists to preserve by record any archaeological features or deposits that may be identified.	Yes – monitoring by Project Archaeologist	Prevention or reduction of significant adverse effects on previously unrecorded archaeological remains within bogland.	Preservation by record will require the agreement of the NMS of the DoHLGH.	NMS approval	Contractor(s)	Construction
CH6	Chapter 17: Cultural Heritage, Section 17.5	Townland boundaries	All extant townland boundaries to be impacted upon will be subject to a written and photographic record prior to construction. This will be carried out by a suitably qualified heritage specialist. The removal of townland boundaries will be subject to archaeological monitoring.	No	Prevention or reduction of significant adverse effects on townland boundaries.	N/A	Sign off by Project Archaeologist	Contractor(s)	Pre-construction Construction
CH7	Chapter 17: Cultural Heritage, Section 17.5	In-situ	The following sites are within the Planning Application Boundary and will be fenced off during construction: <ul style="list-style-type: none"> RMP TN011-022 (enclosure) at Chainage TWA – 80 RMP KD010-042 (enclosure) and ring ditch AAP-184 at Chainage TWE-7750 	No	Avoid direct impacts during construction.	Areas to be fenced off shown in Figures 4.90 and 5.04; and Figure 5.17.	Sites are preserved in-situ	Contractor(s)	Construction
Material Assets									
MA1	Chapter 18: Material Assets, Section 18.5	Prevention of damage to utility infrastructure.	Develop Method Statements to ensure that all underground services are located manually, marked and carefully protected prior to any construction activities commencing. To be informed by pre-construction ground investigations.	No	To prevent accidental damage to utility infrastructure during construction.	Underground surveying techniques, such as a Cable Avoidance Tool and a Signal Generator (genny) and/or surface radar scanning will be used to help confirm the presence of utility services before commencement of any mechanical excavation in the vicinity of underground services.	Implementation of the Method Statements during construction.	Contractor(s)	Pre-construction
MA2	Chapter 18: Material Assets, Section 18.5	Minimise the disruption to rail network from construction of the Proposed Project.	Develop a Method Statement for the construction of rail crossings for agreement with Iarnród Éireann prior to construction commencing.	No	To minimise disruption to the rail network during construction.	N/A	Method Statement agreed with Iarnród Éireann and implemented during construction.	Contractor(s)	Pre-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
Resource and Waste Management									
RW1	Chapter 19: Resource and Waste Management, section 19.5 CEMP – Annex C	Construction Waste and By-Product Management Plan (CWBPMP)	<p>A CWBPMP has been prepared for the Proposed Project and forms Annex C of the CEMP. The appointed Contractor(s) will update and then implement the CWBPMP based on the latest information available regarding the likely waste and by-product arisings and the best practice management techniques for each waste and material.</p> <p>The CWBPMP includes:</p> <ul style="list-style-type: none"> • Minimum requirements for management of waste and byproducts • Need for adherence with the Waste Management Hierarchy for all waste • Waste minimisation measures to be implemented • Waste and byproduct storage measures to be implemented • Management of waste and byproduct streams, including hazardous waste • Targets for beneficial reuse of waste • Procedures for record keeping for all waste and materials management for traceability, including quantities of material reused within the site and transported off-site, and associated licences/ permits/ certifications • Requirements for training of the workforce. 	Yes, as detailed in the CWBPMP, and CEMP.	To ensure effective management of resources and waste streams.	Each contractor will prepare a specific, targeted CWBPMP for their own section of the pipeline/works that complies with the CWBPMP in Annex C of the CEMP. Plan to be in accordance with: Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects (EPA 2021)	Implementation of the CWBPMP Targets achieved	Contractor(s)	Pre-construction Construction
RW2	Chapter 19: Resource and Waste Management, section 19.5	Procurement of materials	<p>The appointed Contractor(s) will be responsible for sourcing materials for the Construction Phase of the Proposed Project, priority will be given to using local suppliers. Minimising the attendant environmental impact and cost of waste transport and support the economic well-being of the local communities in line with the proximity principle.</p> <p>In order to minimise the generation of surplus construction material, the ordering of appropriate quantities using the 'just in time' philosophy will be implemented. The ordering of materials will be managed in line with construction requirements and schedules, and perishable materials will not be ordered far in advance of when needed. Materials will be stored in such a way as to ensure that they are protected from damage through rain, wind, crushing, vehicle impact or any other potential source of damage.</p>	No	Reduce waste production as a result of material procurement.	N/A	Compliance with CWBPMP	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
RW3	Chapter 19: Resource and Waste Management, section 19.5	Management of waste produced during construction	<p>Specific measures for certain types of waste will be as follows:</p> <p>Concrete construction waste will be sent back to the supplier for reuse where feasible. Suitable non-hazardous demolition concrete waste will be removed from site by a licensed waste collection permit holder and transferred to the relevant facility for recovery if all of the end-of-waste criteria are met to avoid disposal to landfill. Should any excess concrete waste arise that cannot be sent back to the supplier or reused on-site, or that is not suitable for end-of-waste recovery, this concrete waste will be removed from site by a licensed waste collection permit holder and transferred to relevant authorised facilities for recovery.</p> <p>Management of drilling waste will be the responsibility of the appointed Contractor(s). During trenchless construction, the bentonite slurry will be reused within the system until reaching the end of its useful life. An amount of spent bentonite will be produced at the end of the tunnelling process. If an alternative use for this material is not identified, it will be disposed of in an appropriately licensed facility. Where bentonite slurry has reached the end of its useful life and is not recoverable, this waste stream will require disposal to landfill.</p> <p>Metal waste will be segregated from other types of waste and where feasible, segregated by ferrous metal and non-ferrous metal. This will allow for the waste to be removed from site by a licensed waste collection permit holder and transferred to a relevant authorised metal waste facility for recycling or recovery.</p> <p>The appointed Contractor(s) will be responsible for the appropriate storage, handling and transport of pile arisings in accordance with best practice guidelines. Arisings will be sampled, tested for contamination, and transported by a suitably permitted vehicle for disposal of to a suitably licensed waste management facility.</p> <p>Construction worker municipal solid wastes generated in temporary welfare facilities will be segregated on-site into mixed municipal waste, mixed recyclables, glass (where generated) and compostable waste (food). The Contractors responsible for each infrastructure site, Construction Compound and Pipe Storage Depot will be responsible for the management of day-to-day waste on-site. Mixed recyclables, glass and compostable waste will be expected to be diverted from landfill to waste recovery facilities. Residual wastes for disposal will be suitable for disposal at waste-to-energy facilities as mitigation.</p>	Yes, as detailed in the CWBPMP, and CEMP.	To reduce waste produced during construction. To adhere to the waste hierarchy.	N/A	Compliance with CWBPMP	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
RW4	Chapter 19: Resource and Waste Management, Section 19.5	Management of imported temporary construction road material	<p>If reuse of imported temporary road material is not required within the Proposed Project, opportunities will be sought for reuse of imported temporary road materials by other end-users.</p> <p>Suitable sites or construction projects requiring soil and stone to be imported will be sought out and agreements put in place with those sites, to confirm the future use of the material is certain and allow for the transport of by-product material from the Proposed Project.</p> <p>If imported rock and stone is contaminated during use as a result of contact with the ground, soils or leaks from construction plant, from engine oils, lubrication oil or engine coolant materials, it will need to be assessed and managed as a waste material, as appropriate. Any contaminated material will need to be segregated and stored separately from other waste types, and will be subject to recovery or disposal, as appropriate.</p>	No	Reduce waste and prevent environmental damage arising from any contaminated waste produced during construction.	N/A	Imported material (rock and stones) would not be classified as waste and would have a residual value.	Contractor(s)	Construction
RW5	Chapter 19: Resource and Waste Management, Section 19.5	Hazardous waste produced during construction	<p>All hazardous waste arising as a result of the construction of the Proposed Project will be managed as per the Waste Management (Hazardous Waste) Regulations 1998 (as amended) (S.I. No. 163 of 1998) and other applicable legislation. 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 any hazardous waste storage locations.</p> <p>The disused petrol station at the WTP access road entrance has the potential to be contaminated. Site investigation works will be required prior to any excavation within this area to determine the nature and extent of potential contamination. Contaminated land excavated will be treated on-site or removed to a suitably licensed facility.</p> <p>Treatment options for hazardous waste reuse and recovery will be explored, depending on the nature of the waste and its hazardous properties.</p> <p>All hazardous waste which cannot be treated will be disposed of through a suitably licensed waste contractor at a suitably licensed/permited facility which can accept hazardous waste.</p> <p>There are no hazardous waste landfills located in Ireland, therefore any hazardous waste produced by the Proposed Project will be disposed of to hazardous waste landfill in pre-existing export markets outside Ireland. As per legislative requirements, records of all hazardous waste generated and removed from site will be retained 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.</p>	Yes, as detailed in the CWBPMP, and CEMP	Prevent environmental damage arising from hazardous waste produced during construction	In 2022 in Ireland, approximately 43% of hazardous waste (excluding soils) and approximately 99% of contaminated soils generated in Ireland that were classified as hazardous, were sent for treatment within Ireland, and the same performance has been used as an assumption within the EIAR waste assessment for the Proposed Project.	Compliance with CWBPMP	Contractor(s)	Construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
RW6	Chapter 19: Resource and Waste Management, Section 19.5	Resource efficiency and minimisation of resource use and generation of waste	<p>The Proposed Project will continue to be designed and constructed to be resource efficient, minimising the use of materials, energy and other resources, and prioritising use of recycled materials in place of primary or secondary aggregates.</p> <p>Five construction principles will be implemented throughout construction to minimise consumption of resources and generation of waste.</p> <p>The five key principles are:</p> <ul style="list-style-type: none"> Design for reuse and recovery: identifying, securing and using materials that already exist on-site, or can be sourced from other projects. The Proposed Project will use the Regulation 27 mechanisms where feasible to reuse materials (see REAC measure RW8) and has set a commitment of zero recoverable waste to landfill Design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content (e.g. using material from low-carbon or sustainable sources) Design for off-site construction: maximising the use of pre-fabricated structure and components, encouraging a process of assembly rather than construction Design for waste-efficient procurement: identifying and specifying materials that can be acquired responsibly, in accordance with a recognised industry standard (e.g. consider opportunities for materials to be returned to the supplier for future reuse (e.g. steel and concrete elements) Design for the future (deconstruction and flexibility): identifying how materials can be designed to be more easily adapted over an asset lifetime 	Yes, as detailed in the CWBPMP and CEMP	<p>To reduce importation of raw materials and avoid unnecessary generation of waste.</p> <p>To contribute towards attainment of Sustainable Development Goal 12 aimed at ensuring sustainable consumption and production patterns.</p>	N/A	<p>Implementation of the design for resource efficiency principles.</p> <p>Evidence of material resource efficiencies and waste reductions will be demonstrated in a number of ways, for example value engineering registers, design meeting records, designing out waste workshops, site waste management plans, specifications, drawings.</p>	Uisce Éireann and/or the Employer Representative Contractor(s)	Pre-construction Construction
RW7	Chapter 19: Resource and Waste Management, Section 19.5	Peat and topsoil management	<p>The Proposed Project will require the excavation of peat deposits which will be managed as a valuable resource for beneficial use rather than disposed. The significant proportion of the peat deposits are on land owned and managed by Bord na Móna. Surplus peat resources following reinstatement along the pipeline 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.</p> <p>When excavating topsoil, the appointed Contractor(s) will, where practicable, segregate, manage and store topsoil in a manner that protects its properties and prevents it becoming a waste, thereby allowing its reuse.</p>	Yes, as detailed in the CWBPMP, and CEMP	To avoid unnecessary generation of waste	<p>REAC measures SG4 and SG5 provide detail on working in peat.</p> <p>REAC measure SG1 (Soil Management Plan) and SG2 provide details on management of topsoil.</p>	No unnecessary wastage of peat	Contractor(s)	Pre-construction Construction Post-construction

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
RW8	Chapter 19: Resource and Waste Management, Section 19.5	Excavated materials management: Regulation 27 and Regulation 28 provisions	<p>Where material is not reusable within the Proposed Project, priority will be given to Regulation 27 classification of by-product over waste. Uisce Éireann undertakes many infrastructure development projects and will explore options for Regulation 27 on other concurrent construction projects prior to the construction start.</p> <p>The excavated material must meet the set of criteria as set out in the EPA's Guidance on Soil and Stone By-products (EPA 2019), in order to be classified as a by-product.</p> <p>Prior to works, the EPA will be notified of the by-product decision and intent for the use of Regulation 27 for any non-greenfield site material. For by-product material that has originated from greenfield sites, the relevant Local Authority will be informed through registration.</p> <p>Only when all other options to prevent, reuse, or recover excess excavated material have been ruled out will recycling, recovery or disposal be considered. The waste will be sent to a suitably licensed or permitted waste facility for compliant handling and/or recycling, recovery or disposal. Any material to be removed from site will be transported in compliance with a valid Waste Collection Permit. In accordance with the proximity principle, the closest suitable facilities will be utilised, where practicable, to minimise the impacts associated with transporting the material.</p> <p>Should Regulation 27 use of the materials not be feasible, the following end-of-waste and waste recovery options (listed in line with the waste hierarchy) will be pursued:</p> <ul style="list-style-type: none"> Regulation 28 soil treatment facilities (mechanism for recovery of wastes that may be used to process and recover arisings prior to disposal) Landfills requiring wastes for restoration Soil treatment facilities. 	Yes, as detailed in the CWBPMP, and CEMP	To avoid unnecessary generation of waste. Adherence to the waste hierarchy.	<p>Regulation 27 of the EC (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) sets out the criteria for the declaration of a material generated through construction as a by-product rather than a waste.</p> <p>Regulation 28 of the EC (Waste Directive) Regulations 2011 sets out the requirements under which a material, which is recovered or recycled from waste, can be deemed to be no longer a waste and complies with a set of end-of-waste criteria.</p> <p>Adherence to Guidance on Soil and Stone By-products (EPA 2019).</p> <p>National By-Product Criteria for greenfield soil and stone (BP-N002/2024) is used to determine if material qualifies as greenfield.</p>	Regulation 27 approvals	Uisce Éireann and/or the Employer Representative Contractor(s)	Pre-construction Construction Post-construction
RW9	Chapter 19: Resource and Waste Management, Section 19.5	Managing waste during the Operational Phase	<p>Waste will be segregated on-site as far as reasonably practicable. Waste will be segregated into mixed municipal waste, mixed recyclables, glass (where generated) and compostable waste (food) to minimise the amount of waste requiring disposal and in compliance with the waste hierarchy. The operators of the RWI&PS, WTP, BPT, BPS, FCV and TPR will be responsible for the management of day-to-day waste on-site and for the appointment of a waste contractor. Mixed recyclables, glass and compostable waste will be diverted from landfill to waste recovery facilities. Residual wastes for disposal will be suitable for disposal at waste-to-energy facilities as mitigation.</p>	No	<p>Reduce volume of waste generated during the Operational Phase and manage it in a manner to reduce effects on the environment.</p> <p>To avoid the need to dispose of waste to landfill and to meet Uisce Éireann's corporate objective to send zero tonnes of recoverable waste to landfill.</p>	N/A	Handover Environmental Management Plan once the Proposed Project is constructed and commissioned.	Uisce Éireann	Operation

Ref. no.	Source ref.	Topic	Action/commitment	Monitoring required	Objective	Assumptions	Achievement criteria	Responsible persons	Stage
RW10	Chapter 19: Resource and Waste Management, Section 19.5	Sludge production and disposal at the WTP during the Operational Phase	<p>Uisce Éireann will manage operational residual water sludge arisings so that all residual sludges from the WTP will be managed via sustainable outlets as further opportunities develop to move sludge treatment away from landfill capping.</p> <p>Where feasible, the closest suitably licensed facility will be chosen so as to minimise impacts associated with the ground transportation of waste. All transportation of operational residual water sludge waste from the site will be carried out by an operator with a valid Waste Collection Permit. It will be the responsibility of the WTP operator in conjunction with Uisce Éireann to ensure that the sludge is managed in a suitable and compliant manner.</p>	No	Reduce volume of waste generated during the Operational Phase and manage it in a manner to reduce effects on the environment.	There will be no requirement for discharge of process washwater from the WTP.	Handover Environmental Management Plan once the Proposed Project is constructed and commissioned.	Uisce Éireann	Operation
RW11	Chapter 19: Resource and Waste Management, Section 19.5	Managing hazardous waste during the Operational Phase	It will be the responsibility of the appointed Waste Contractor(s) to ensure that all hazardous waste generated through the Operational Phase of the Proposed Project are segregated from non-hazardous waste streams. Hazardous waste will be collected by suitably permitted waste contractor(s) and taken to facilities which are permitted to accept hazardous waste for treatment and/or disposal. In the absence of national landfill capacity this may include export for treatment and disposal.	No	To effectively manage hazardous waste generated during the Operational Phase.	N/A	Handover Environmental Management Plan once the Proposed Project is constructed and commissioned.	Uisce Éireann	Operation
Risk of Major Accidents and Disasters									
R1	Chapter 20: Risk of Major Accidents and Disasters, Section 20.4	Mitigation for the risk of failure of silt curtain	Implement a regime of regular removal of silt build-up behind the silt curtains at the Raw Water Intake.	Yes – monitor silt build up.	Reduce the impact/consequence of a pollution event in the event that the double silt curtain fails.	N/A	Regular inspections of the silt curtain. Recording of inspections and actions taken.	Contractor(s)	Construction