Tionscadal Soláthair Uisce
Water Supply Project

Environmental Impact Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix A9.3) Non-linear Principal Infrastructure and 38kV Uprate Works Assessment

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TOBIN

Contents

Acronyms and Abbreviations

Acronym	Meaning
AWB	Artificial Water Body
BPS	Booster Pumping Station
BPT	Break Pressure Tank
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CWT	Clear Water Tank
DWPA	Drinking Water Protected Area
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
ESBN	Electricity Supply Board Networks
FCV	Flow Control Valve
GDA	Greater Dublin Area
HLPS	High Lift Pumping Station
HMWB	Heavily Modified Water Body
IFI	Inland Fisheries Ireland
mAOD	Metres Above Ordnance Datum
NHA	Natural Heritage Area
pNHA	Proposed Natural Heritage Area
PWWC	Passive Wedge-Wire Cylinder
RWI&PS	Raw Water Intake and Pumping Station
RWRMs	Raw Water Rising Mains
SAC	Special Area of Conservation
SPA	Special Protection Area
SuDS	Sustainable Drainage System
SWMP	Surface Water Management Plan
TPR	Termination Point Reservoir
WFD	Water Framework Directive
WRZ	Water Resource Zone
WTP	Water Treatment Plant
W-SC	Water Specific Mitigation Item

1. Introduction

1. This appendix assesses the likely significant effects of the non-linear components of the Proposed Project including Proposed 38 kV Uprate Works on the surface water environment. An assessment of the proposed abstraction is provided in Appendix A9.1 (Abstraction Assessment) and an assessment of the likely significant effects of the pipeline elements of the Proposed Project is provided in Appendix A9.2 (Pipeline Assessment).

2. This appendix is intended to be read alongside, and to support, the Environmental Impact Assessment Report (EIAR) for the Proposed Project, in particular Chapter 9 (Water). Chapter 9 addresses the Proposed Project's likely significant effects on the surface water environment. This appendix should also be read alongside the Water Framework Directive Compliance Assessment, as reported in the Water Status Impact Assessment Report, which addresses the Proposed Project's compliance with the requirements of the Water Framework Directive (WFD).

3. A full description of the Proposed Project is provided in Chapter 4 (Proposed Project Description). Effects related to groundwater are detailed in Chapter 10 (Soils, Geology & Hydrogeology).

4. The principal non-linear infrastructure elements (herein referred to as non-linear infrastructure sites) assessed in this appendix are:

    - Raw Water Intake & Pumping Station (RWI&PS)
    - Water Treatment Plant (WTP)
    - Break Pressure Tank (BPT)
    - Booster Pumping Station (BPS)
    - Flow Control Valve (FCV)
    - Termination Point Reservoir (TPR)
    - Proposed 38 kV Uprate Works.

5. The structure of this appendix is as follows:

    - A summary of the non-linear infrastructure components (Section 2)
    - A description of the study area (Section 3)
    - An outline of the assessment methodology (Section 4)
    - An overview of design embedded mitigation and generic mitigation measures (Section 4)
    - A detailed assessment of the baseline and likely significant effects on the surface water environment (Section 5), including:
        - A description of the baseline environment associated with each non-linear infrastructure site
        - A description of the works at each non-linear infrastructure site
        - Overview of the range and likely significant effects on the surface water environment at each non-linear infrastructure site
        - Construction Phase effects, mitigation measures and residual effects
        - Operational Phase effects, mitigation measures and residual effects
        - A summary of effects on the surface water environment.

2. Project Components

6. Table 2.1 provides a summary of the principal project infrastructure. A full description is provided in Chapter 4 (Proposed Project Description).

Table 2.1: Summary of Principal Proposed Project Components

Proposed Project Infrastructure	Outline Description of Proposed Project Infrastructure*
Permanent Infrastructure	
Raw Water Intake and Pumping Station (RWI&PS) (Infrastructure Site) County Tipperary	• 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	• 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	• 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	• 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	• 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)	• 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	• 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*
Flow Control Valve (FCV) (Infrastructure Site) County Kildare	• 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.
Termination Point Reservoir (TPR) (Infrastructure Site) County Dublin (within the administrative area of South Dublin County Council)	• 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	
Proposed 38 kV Uprate Works Ardnacrusha – Birdhill (Power Supply) Counties Clare, Limerick and Tipperary	• 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	
Construction Working Width Counties Tipperary, Offaly, Kildare and Dublin (within the administrative area of South Dublin County Council)	• 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*
Construction Compounds Counties Tipperary, Offaly, Kildare and Dublin (within the administrative area of South Dublin County Council)	• 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.
Pipe Storage Depots Counties Tipperary, Offaly and Kildare	• 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.

3. Study Area

7. This assessment is limited to surface water bodies only. For the purposes of this assessment, a water environment receptor is any water body, standing water or attribute thereof, potentially impacted by the construction and operation of the non-linear infrastructure sites associated with the Proposed Project.

8. Study areas have been defined using relevant guidance listed in Section 9.2.2 of Chapter 9 (Water) and professional judgement by a competent expert to identify potential source-pathway-receptor linkages and likely significant effects associated with the construction and operation of the non-linear infrastructure sites of the Proposed Project.

9. In principle, the following approach has been adopted:
    - Infrastructure sites: The study area for each is defined by a 50m radius from the Planning Application Boundary
    - Proposed 38 kV Uprate Works:
        - Any water body (WFD-designated or other) crossed by the Proposed 38 kV Uprate Works
        - Water bodies within 50m of the Proposed 38 kV Uprate Works.

10. Details of the study areas for the non-linear infrastructure sites are provided in Section 5.2 to Section 5.8 of this appendix.

3.1 Water Body Naming Conventions

11. All water bodies within the study area crossed by the non-linear infrastructure sites and the Proposed 38 kV Uprate Works, along with the nomenclature (i.e. WCX, WBX and WBP), are identified as follows:
    - WFD designated Water Bodies – water bodies designated by the EPA as river water bodies under the WFD
        - Watercourse crossing ID WCX is applied for crossings of these water bodies by the pipeline
        - Watercourse crossing ID PSNWCX is applied for crossings of these water bodies by the Proposed 38 kV Uprate works
    - Other Waterbodies - water bodies not designated by the EPA as river water bodies under the WFD
        - Watercourse crossing ID WBX is applied for crossings of larger rivers not designated by the EPA under the WFD by the pipeline. However, it should be noted that WBX water bodies can include water bodies identified by the EPA as artificial water bodies under the WFD (such as canals)
        - Watercourse crossing ID PSNWBX is applied for crossings of larger rivers not designated by the EPA under the WFD by the Proposed 38 kV Uprate works
        - Watercourse crossing ID WBP is applied for crossings of field drains or ditches not designated by the EPA under the WFD by the pipeline. These drains and ditches are likely to be intermittent (may not flow during dry conditions)
        - Watercourse crossing ID PSNWBP is applied for crossings of field drains or ditches not designated by the EPA under the WFD by the Proposed 38 kV Uprate works. These drains and ditches are likely to be intermittent (may not flow during dry conditions).

4. Assessment Methodology

12. The method for the assessment of likely significant effects has been undertaken in accordance with Section 9.2.5 of Chapter 9 (Water), whereby the sensitivity of surface water 'attributes' to changes as a result of the Proposed Project are determined by a set of criteria including their relative sensitivity or 'value' (e.g. whether features are of national, regional or local value). Table 9.5 of Chapter 9 (Water) outlines the criteria for estimating the sensitivity of receptors and their attributes.

13. Each receptor is assigned a sensitivity for three separate water environment attributes:
    - Surface water quality and hydrology
    - Hydromorphology
    - Surface water supply.

14. The sensitivity categories are negligible, low, medium, high and very high.

15. Water body sensitivity is also determined by whether or not the receptor is within, or has a pathway downstream to, one or more of the following designations:
    - Water bodies within Drinking Water Protected Area (DWPA)
    - Special Protection Area (SPA)
    - Special Area of Conservation (SAC)
    - Natural Heritage Area (NHA)
    - Proposed Natural Heritage Area (pNHA)
    - Nutrient Sensitive River and/or Lake.

16. There are no known surface water abstractions within 50m of the Non-linear Infrastructure sites and 38kV Uprate Works and no water bodies within DWPAs with potential pathways within 2km downstream of the non-linear infrastructure sites. Therefore, surface water supply has been scoped out of the impact assessment as no impacts are anticipated.

17. The magnitude of impacts on receptors (for each of the two remaining surface water attributes) is then determined in accordance with Table 9.6 of Chapter 9 (Water). The magnitude of impact categories are negligible, low, medium and high.

18. Once the magnitude is determined, the significance of an effect on water bodies (for each of the two remaining surface water attributes) is then assigned by combining the sensitivity of the receptor with the predicted magnitude of impact, as shown in Table 9.7 of Chapter 9 (Water) and replicated in Table 4.1 below.

Table 4.1: Significance of Environmental Effects (EPA 2022)[1]

Magnitude of Impacts	Sensitivity of Receptor				
	Negligible	Low	Medium	High	Very high
Negligible	Imperceptible	Not Significant	Not Significant	Not Significant	Not Significant
Low	Not Significant	Slight (not significant)	Slight (not significant)	Moderate (significant)	Significant
Medium	Not Significant	Slight (not significant)	Moderate (significant)	Significant	Very Significant
High	Not Significant	Moderate (significant)	Significant	Very Significant	Profound

4.1 Mitigation

19. A hierarchical approach to mitigation has been adopted for the Proposed Project, seeking to avoid adverse effects in the first instance through site selection or through an iterative approach to design. This is 'embedded mitigation' and is assumed to be in place during the assessment of effects. These are described in Section 4.2 and within relevant sections of the impact assessment.

20. Where avoidance is not feasible, and where likely significant effects are identified during the impact assessment, mitigation measures are proposed to prevent or reduce those effects. As discussed in Section 9.5 of Chapter 9 (Water), there are two types of mitigation: generic mitigation measures and 'site-specific' mitigation measures. Each potentially significant adverse effect requires mitigation; however, many effects can and would be addressed using generic mitigation including the application of best practice in the construction of the Proposed Project. These are set out in Annex A Appendix A5.1 (Construction Environmental Management Plan (CEMP)). Site-specific mitigation has been developed where generic mitigation would be inappropriate, ineffective, or insufficient to avoid or minimise effects. These are listed in Sections 5.2 to 5.8 of this document under the Construction and Operational Phase Mitigation sub-sections. Site-specific mitigation measures are detailed in Annex A (Surface Water Management Plan (SWMP)) of Appendix A5.1 (CEMP).

4.2 Design Phase/Embedded Mitigation

21. The proposed locations for the non-linear infrastructure sites have been carefully selected by carrying out a Multi-Criteria Analysis of the likely impacts on environmental criteria including the surface water environment. Details of alternatives considered are provided in Chapter 3 (Consideration of Reasonable Alternatives). In particular, the locations have been selected with the aim of reducing proximity to sensitive water bodies. As the Proposed 38 kV Uprate Works to supply power to the RWI&PS and the WTP are uprate works based around existing infrastructure, opportunities for avoidance of adverse effects were limited.

22. Permanent features which result in the avoidance or reduction of effects during the lifetime of the Proposed Project are considered part of the design of the Proposed Project (also known as embedded mitigation) and as such are included in the initial assessment of effects. Chapter 4 (Proposed Project Description) provides the details of the permanent design features which would result in effects being avoided or reduced. The following features are common to more than one of the non-linear infrastructure sites:

    - There would be no discharge of process wastewater from the RWI&PS and WTP sites to the water environment; it would be recirculated through the plants

[1] EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports, https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

- Surface water management at each site has been designed so there would be no net increase in runoff rates from those predicted from the existing greenfield sites
- Wastewater from welfare facilities would be contained and disposed of off-site.

4.3 Generic Construction Phase Mitigation

23. Generic mitigation measures for use across the Proposed Project are detailed in Annex A (SWMP) of Appendix A5.1 (CEMP) and include:

- Typical construction compound and site establishment measures:
  - 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 site 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 Office of Public Work's The Planning System and Flood Risk Management Guidelines (November 2009)
  - 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
- Dewatering:
  - All dewatering works will be carried out in accordance with the requirements of the Construction Industry Research and Information Association (CIRIA) guidance document C750 Groundwater Control – Design and Practice 2nd Edition (CIRIA 2016)
  - An appropriate dewatering system and groundwater management system will be designed and maintained
  - Silt-laden runoff and water ingress into excavations will be minimised
- Control of silty water runoff:
  - Clearing and topsoil stripping of each phase of works will be delayed until shortly before construction begins to minimise duration of stockpiled material

  - Cut-off ditches, berms or diversion channels will be utilised around working area boundaries, where possible, to limit surface water entering excavated areas and silty water running off the site into water bodies
  - 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 to minimise the risk of silty water runoff from the site
- Stockpiling of materials:
  - 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
- Working in or near watercourses:
  - 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 water body 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 a 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. In-stream 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. The timing of works will always be considered on a site-specific basis and in agreement with IFI, as 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 otherwise 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

- Use of concrete:
  - 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

- Vehicle and plant maintenance, refuelling, washing, storage and movement:
  - 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
  - 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 or drainage ditch or within 50m of a borehole or well
  - 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
  - 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
  - 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
  - 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 and emergency procedures are displayed, and a suitably sized spill kit is available at all delivery points. Staff should be trained in these procedures and use of spill kits.

5. Assessment of Non-Linear Infrastructure Sites

5.1 Overview

24. This section considers and assesses likely significant effects of the construction and operation of the non-linear infrastructure sites associated with the Proposed Project prior to mitigation and control measures being implemented, unless already included in the design as embedded mitigation.

25. Chapter 5 (Construction & Commissioning) outlines the principal construction activities required to complete the proposed works and includes details of the activities required to undertake the construction of the RWI&PS, WTP, BPT, BPS, FCV, TPR, Proposed 38 kV Uprate Works and any relevant access roads.

26. Temporary works would be in place for as long as is required to complete the activity or task under construction.

5.2 Raw Water Intake and Pumping Station (RWI&PS)

5.2.1 Design and Operation

27. Details of the design and construction of the RWI&PS are provided in Chapter 4 (Proposed Project Description) and Chapter 5 (Construction & Commissioning). A brief description is provided in Table 2.1 of Section 2 (Project Components).

5.2.1.1 Access

28. It is proposed to construct a new access road which would be oriented east to west from the R494 to the proposed RWI&PS site. The road would be 5m in width and would have a length of 670m. Car park spaces would be provided on-site for 16 vehicles.

5.2.1.2 Design (Including Embedded Mitigation)

5.2.1.2.1 General Intake Chamber Design

29. An Intake Chamber is proposed on the bankside of the Derg HMWB (Parteen Basin). Existing ground levels on the bank at the proposed intake site are approximately 31.0 metres Above Ordnance Datum (mAOD). The existing lough bed of the Derg HMWB itself would be re-profiled to finished levels of between 26.0mAOD and 25.5mAOD over an area of approximately 55m by 27m at the intake site. Flexible concrete revetment mats or panels would be placed over that area and covered with gravel and native bed material.

30. The proposed intake design includes an Intake Chamber within a concrete intake basin excavated to a depth of 7.7m below existing ground level. The Intake Chamber has been designed to minimise effects on the aquatic environment through the following:

- The Intake Chamber would be fitted with three Passive Wedge-wire Cylinder (PWWC) Intake Screens to avoid debris and/or fish or eels being taken up into the raw water pumps
- Intake velocities through the screen slots would be limited to 0.15m/s, the velocity at which juvenile fish can swim away without being trapped/held by the screen. The screens would feed into three separate but interconnected chambers, from which water would be drawn by the pumps, via a manifold suction pipe
- The PWWC Intake Screens would be approximately 2.0m in diameter and would be set at an invert level (base interior level) of 27.0mAOD at the abstraction point. The level of the screens would maintain a water depth of at least 1.0m above the crown (top) of the screens and thus have been designed to minimise effects on the aquatic environment.

5.2.1.2.2 Intake Chamber Design Measures Relevant to Water Quality and Ecology

31. The bankside structure would comprise the 'wet infrastructure' including the Intake Chamber with PWWC Intake Screens and Inlet Chambers, located within a substructure with a roof slab at finished ground level.

32. A bubble curtain would be provided at the inlet to the chamber housing the PWWC Intake Screens. The bubble curtain is a system that produces fine bubbles of air across the entrance to the intake structure, which act as a barrier (a curtain) discouraging fish from entering the intake.

33. The PWWC Intake Screens would be made of a copper-nickel alloy to minimise the risk of zebra mussel attachment; some pro-active anti-fouling measures would also be needed to protect the intake pipes from becoming clogged. The pipes would be internally coated with proprietary products to discourage zebra mussels from attaching to the pipe wall.

5.2.1.2.3 Raw Water Pumping Station Building

34. The raw water pumps and pipework would be located in a dry well installation, in the basement of the Raw Water Pumping Station Building. The installation also includes four Raw Water Surge Vessels for the Raw Water Rising Mains (RWRMs), two on each RWRM. The Raw Water Surge Vessels would be located external to the Raw Water Pumping Station Building superstructure.

35. The wet chambers of the Intake Chamber would be able to accept inflow throughout the upper and lower levels that ESB applies to Parteen Basin (Derg HMWB), and in flood conditions. A Raw Water Rising Mains Scour Tank would be located at the RWI&PS below the Microfiltration Buildings. The Raw Water Rising Mains Scour Tank would be used to receive water from the RWRMs and swabbing chamber when the pipes are being cleaned.

36. Microfilters to prevent the transfer of zebra mussel/Asian clam from the Derg HMWB would sit on a manifold located on a loop off each RWRM. Raw water would pass through these units and dirt particles and juvenile mussels would be trapped in the unit, forming a 'filtration cake'. This cake would cause a pressure drop across the unit and a self-cleaning process would be triggered. The self-cleaning process involves the units being flushed regularly to clean away any zebra mussels or other waste material trapped in the filters.

37. A filter flush-out pipe would carry the wash water to an Invasive Species Debris Retention Tank, located to the east of the Microfiltration Buildings. This wash water would be subject to ultraviolet treatment to kill mussel juvenile forms (veligers) before being settled in the Invasive Species Debris Retention Tank.

38. A draw-off pipe would take supernatant liquid (the clear liquid that lies above the solid residue) from the tank and transfer it back to the intake, from where it would be pumped onwards for treatment at the WTP. Rejected solid material settled out in the Invasive Species Debris Retention Tank would be removed from site to an appropriately authorised facility.

5.2.1.2.4 Drainage

39. Rainfall runoff from roads and impermeable areas would be conveyed via a drainage system to a Stormwater Attenuation Tank, as shown in Figure 4.61 of Chapter 4 (Proposed Project Description). An Oil Interceptor would be located immediately upstream of the attenuation tank. The volume of the attenuation tank would be 125m^3 and has been appropriately sized to attenuate the required flow volumes. A flow control device on the outlet of the tank would limit discharge of stormwater flow leaving the tank to 17.35l/s, equivalent to the greenfield runoff from the entire RWI&PS site. Flow from the attenuation tank would be conveyed by a 225mm diameter drain along the RWI&PS access road to a local water body (watercourse) as shown on Figure 4.62 of Chapter 4 (Proposed Project Description).

40. Drainage from the new access road to the RWI&PS site from the R494 would be 'over the edge' to a hardcore longitudinal soakaway along both edges of the road.

41. On the RWI&PS site itself, rainwater from the roofs of the Raw Water Pumping Station Building and the two Microfiltration Buildings would be harvested and taken into the Intake Chamber and the Raw Water Rising Mains Scour Tank respectively.

42. Foul wastewater generated by operational staff on the site is estimated at less than $1m^3/d$ and would be tankered from the wastewater tank shown on Figure 4.61 of Chapter 4 (Proposed Project Description) to a licensed Wastewater Treatment Plant.

5.2.2 Construction

43. Full details of the construction of the RWI&PS are provided in Chapter 5 (Construction & Commissioning). Brief details, of relevance to this assessment, are also provided here for ease of reference. The description of works in Section 5.2.1.2 and Table 2.1 of Section 2 (Project Components) is considered to be embedded mitigation for the purposes of this assessment.

44. The construction of the RWI&PS would involve extensive excavation of the site to construct the Raw Water Pumping Station Building and below ground pipework. Principally, the construction materials for the RWI&PS would involve reinforced concrete poured in situ, structural steelwork, building work, prefabricated steel tanks, and above and below ground steel pipework.

45. In particular, works would be undertaken in the Derg HMWB adjacent to the shore to enable the construction of the Raw Water Intake Basin. Other construction activities would include landscaping, an access road and internal circulation roads, car parks and walkways, security fencing, mechanical and electrical plant, instrumentation and control systems, and building services. In addition, a new mains supply would be provided off the electrical grid, to power the various plant and equipment in the RWI&PS.

5.2.2.1 Construction Main Elements and Sequencing

46. The main elements and sequence of construction activities are provided in Table 5.1 along with additional information relevant to this assessment.

Table 5.1: RWI&PS Construction Main Elements

Sequence	Construction Activity	Further Details (of Relevance to Assessment)
1	Site preparation works, including temporary access road, temporary fencing, tree felling and vegetation clearance, topsoil stripping, and site compound	• A buffer zone from the Fort Henry Embankment would be permanently fenced off to demonstrate that the embankment has been excluded from temporary or permanent works. Permanent 2.4m high polyester powder coated paladin security fencing of the RWI&PS site would be erected at the outset and protective temporary fencing would be erected inside the permanent fence • Extensive tree felling and associated site clearance • Post clearance, the RWI&PS site would be constructed and a working space for the construction works would be created • The access road would be formed initially as hardcore temporary access and become the basis for the permanent surface when civil/building works are complete • Topsoil would be stripped across the required site area to its full depth. Topsoil and subsoil management would be carried out as described within Chapter 5 (Construction & Commissioning). Any existing land drains crossing the works area would be recorded and culverted. The topsoil and top layer of subsoil stockpiles would be located away from drains and water bodies • Laydown areas would be established, which would be used by the appointed Contractor to accommodate temporary construction facilities such as site offices, parking, and storage of construction materials. Such areas would be underlain with geogrid mattress or similar with stone overlain as required • Formation of bunded fuel storage areas with hydrocarbon interceptors. Such areas would be >50m from the Derg HMWB • The Satellite Construction Compound (CC0) area would be established as shown on Figure 5.1 of Chapter 5 (Construction & Commissioning).
2	Excavation of groundwater settlement basins and construction of Wastewater Holding Tank (for use as temporary pump sump for returning settled groundwater to Parteen Basin). Use excavated material to raise ground levels	• The main earthworks operations would entail excavation of the areas of the groundwater settlement basins, the footprint of the RWI&PS Intake Chamber and substructures and the Raw Water Rising Mains Scour Tank, Microfiltration Buildings and Invasive Species Debris Retention Tank • Earthworks to form structures would include the removal of excavated material off site to the WTP site (to raise ground levels there) and stockpiling of the volume of material required to backfill excavations on the RWI&PS site once the substructures are complete. • Dewatering would be required to maintain dry working conditions.
3	Placing of temporary piling platform in Parteen Basin to allow secant pile construction along Basin shoreline. The platform may be constructed using sheet piles in Parteen Basin to contain the platform.	• A temporary piling platform would be constructed in Parteen Basin to accommodate the placing of the secant piles along the existing shoreline in constructing the Intake Chamber • A double row of heavy-duty Type 3 silt curtains would be placed around the construction area to prevent silt from entering the main Parteen Basin body of water.
4	Construction of Intake Chamber (for Passive Wedge-wire Cylinder screens), Inlet Chambers and Raw Water Pumping Station Building substructure	• The most likely method of construction would be using secant pile walls • In order to construct the secant pile walls a shallow guide wall would be constructed at ground level around the perimeter of the underground structures • The primary piles would then be formed by drilling a series of boreholes into the ground down to the bedrock level at every second pile location and then filling the boreholes with concrete • Once the primary piles are cast an augur would cut and remove the soil between the primary piles • A steel reinforcement cage would be lowered into the secondary borehole and then it would be filled with concrete to form the secondary pile, which intersects with the primary piles to form a continuous structure • This process would be repeated around the perimeter of the structure until the secant pile wall is complete • The area within the pile wall would then be excavated and the Raw Water Pumping Station Building substructure can be constructed • Continuous dewatering facilities would be provided until the structure is watertight • The construction of the Intake Chamber would likely be from land, as described above, but it is also possible that this work would be facilitated from moored pontoons on Parteen Basin using working barge(s) • The substructures for the RWI&PS would be constructed using either top-down methodologies or by piling and excavation.

Sequence	Construction Activity	Further Details (of Relevance to Assessment)
5	Removal of temporary platform (and any associated sheet piles) and excavation/reprofiling of Raw Water Intake Basin and placing of concrete revetment mats over reprofiled Parteen Basin bed	• Temporary platform would be removed once the substructure has been constructed • Once the Intake Chamber and Pumping Station substructure is completed, Parteen Basin bed would be reprofiled in the area immediately outside the Intake Chamber. Dredging equipment would be used for the reprofiling over an area of approximately 55m by 27m • Silt curtains would remain in place until this operation has been completed and silt has settled out • Once the bed has been reprofiled, a concrete revetment mat (a flexible mat of meshed thin concrete segments with voids) would be threaded by non-corroding heavy duty nylon rope and lifted into place by a crane and lifting bracket • It would be placed on the reprofiled bed and used for erosion control • It can 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.
6	Construction of Raw Water Rising Mains Scour Tank, Microfiltration Buildings substructure, and Invasive Species Debris Retention Tank	• Construction of these elements would be set back from the Derg HMWB within the proposed footprint of the RWI&PS site. Construction drainage would remain in place through the Construction Phase.
7	Construction of Raw Water Rising Main Swab Chamber, Flow Meter Chamber, Oil Interceptor and Stormwater Attenuation Tank	
8	Construction of RWI&PS and Microfiltration Buildings superstructure	
9	MEICA installation	
10	Construction of 20 kV electricity substation and connection to electricity supply	
11	Site works, landscaping and boundary treatment	
Throughout	Dewatering	• Continuous dewatering until the secant pile wall structure is watertight. Water would be pumped into two lined dewatering settlement basins in sequence, with an Oil Interceptor positioned between basins one and two. Water retention time would be in excess of 24 hours • Water then filtered through a fine mesh and then discharged to the Derg HMWB via Oil Interceptor • Basins also used to accept runoff water discharging downgradient from the construction working width at the RWRMs and from the pipeline trench.
Throughout	Foul and potable water connections	• Potable water via the access road and temporary connection to public watermain in R494. Temporary Connection may remain as a permanent connection as would be an operational site • Wastewater to a holding tank, periodically emptied and tankered to a Wastewater Treatment Plant.

5.2.3 Study Area and Baseline Conditions

5.2.3.1 Study Area

47. The study area, which is designed to capture likely significant effects on water bodies as a result of the Construction, Testing and Commissioning, and Operational Phases at the RWI&PS, is as follows:
    - The Derg HMWB (Parteen Basin)
    - The banks of the Derg HMWB, 200m upstream and downstream of the RWI&PS Planning Application Boundary

- To incorporate any surface water drains on the proposed site of the RWI&PS
- To incorporate any water bodies within 50m of the RWI&PS site boundary.

48. See A9.3 Figure 3 for the Derg HMWB (Parteen Basin) study area, A9.3 Figure 4 for the Parteen Weir study area and A9.3 Figure 5 for the RWI&PS study area.

49. Based upon professional judgement, 50m has been chosen as the extent of the study area as it is considered the furthest point at which effects could occur as a result of contaminated surface water runoff or spillages. There is no Irish guidance related to the proximity of works adjacent to receptors. Based on professional judgment, however, where a water body is not being worked on specifically, a 10m buffer zone would be applied where practicable for oil/fuel and chemical storage.

50. Effects on hydrology as a direct result of the abstraction are addressed in Appendix A9.1 (Abstraction Assessment) and so these have not influenced the study area for this assessment.

5.2.3.2 Baseline Conditions

51. The Derg HMWB was constructed in 1929 as part of the construction of the Ardnacrusha Generating Station. Water was diverted from the River Shannon downstream of Killaloe via a dam and intake weir at Parteen to the power station along a new 12km Headrace. The resultant reservoir is classified as an HMWB (Derg HMWB) within the River Basin Management Plan. The Ardnacrusha Canal upstream of the power station is known as the Headrace; downstream it is the Tailrace. These are classified as artificial water bodies (AWBs) under the Water Action Plan 2024 (Department of Housing, Local Government and Heritage 2024).

52. Detailed baseline characteristics are provided in Table 5.2. It should be noted that the Kilmastulla_050 appears to outfall to the Derg HMWB. Prior to the construction of the Ardnacrusha Generating Station and the creation of Parteen Basin (Derg HMWB), the Kilmastulla_050 did outfall to the Shannon (Lower)_050 in this location. However, it was diverted during the construction of Parteen Basin Reservoir and now flows south along the eastern edge of the reservoir out-falling to the Shannon (Lower)_050 immediately downstream of Parteen Weir (see A9.3 Figure 2).

53. A statutory minimum compensation flow of 10m^3/s is required to be released over Parteen Weir to the Shannon (Lower)_050 and further downstream to the Shannon (Lower)_060 (known locally as the Old River Shannon) (Shannon Fisheries Act 1935). The remainder of the flow passes to the Ardnacrusha Generating Station, up to an approximate maximum flow of 400m^3/s. Any flows beyond 400m^3/s are discharged to the Shannon (Lower)_050. Further details of flows in the Shannon (Lower)_050 are provided in Appendix A9.1 (Abstraction Assessment).

Table 5.2: Summary of Baseline Conditions of Water Bodies within the RWI&PS Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Proposed RWI&PS – WFD Designated Water Bodies					
Derg HMWB	Good	Not at risk	• WFD designated lacustrine water body of Good Ecological Potential • Forms part of the Lower River Shannon SAC and is a designated nutrient sensitive surface water body • Existing significant pressures include the heavily modified designation related to the effects of Parteen Weir at the water body's southern extents. The weir was established to raise the level of what was the river upstream (now Lough Derg HMWB) to create water storage. As such, the weir diverts the majority of flow down the Headrace to the Ardnacrusha Generating Station for hydropower generation. The lough is constrained by artificial embankments and water levels are controlled • No known abstractions and no potential pathways downstream (within 5km) to a water body within a DWPA.	Very high	Medium
Shannon (Lower)_050 (Downstream of Parteen Weir)	Poor	At Risk	• The Shannon (Lower)_050 downstream of Parteen Weir is a WFD designated water body with Poor status. The water body forms part of the Lower River Shannon SAC. The water body forms a moderately sinuous planform displaying limited diverse morphological features and processes. Existing significant pressures include Parteen Weir which marks the upstream extents of the water body. The weir forms a flow split between water outflowing from Lough Derg to the Shannon (Lower)_050 and the Ardnacrusha Canal. The weir diverts the majority of flow down the canal to the Ardnacrusha Generating Station for hydropower generation. The presence of the weir means that the Shannon (Lower)_050 has a significantly altered flow regime with substantial reductions in flow overall, and a largely fixed, minimum compensation flow. The weir acts as a barrier to fish. The weir is also a barrier to the movement of sediment down river, starving downstream reaches of coarse sediment. This impacts the structure and substrate of the Shannon (Lower)_050 and its ability to form morphological features. Additionally, the river is disconnected from its natural floodplain and therefore natural channel forming processes are much reduced • There are no known abstractions and although the water body is connected to a water body within a DWPA (Shannon (Lower)_060), this is not within 2km of Parteen Weir.	Very high	Medium

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Proposed RWI&PS Works – Other Waterbodies					
WBX002	Non-designated	N/A	• Other Waterbody, with <2km downstream pathway to the Derg HMWB (Good Status) and the Lower River Shannon SAC. Straightened/modified planform with limited fluvial processes. No known abstractions and no potential pathway downstream (within 5km) to a water body within a DWPA.	High	Low
WBP062	Non-designated	N/A	• Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. Other Waterbody is a drain with no morphological features or processes and likely to dry up in summer months. No known abstractions and no potential pathway downstream (within 5km) to a water body within a DWPA.	High	Negligible
WBP396	Non-designated	N/A	• Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. Other Waterbody is a drain with no morphological features or processes and likely to dry up in summer months. No known abstractions and no potential pathway downstream (within 5km) to a water body within a DWPA.	High	Negligible

5.2.4 Construction Phase Effects

5.2.4.1 Derg HMWB

5.2.4.1.1 Surface Water Quality and Hydrology

Intake Structure and Dewatering – Hydrology

54. There would likely be ingress of water to the construction site from the Derg HMWB (Parteen Basin) as well as groundwater and surface water flows from surrounding fields. The permeability of the subsoil is assessed to be low (See Chapter 10: Soils, Geology & Hydrogeology) and so groundwater ingress is expected to be limited; there would be continuous ingress of water from the Derg HMWB at the outset, which would be dewatered until the secant piled wall is watertight.

55. Following installation of the secant piling, any dewatering would not directly impact upon water volumes within the Derg HMWB.

56. In order to address water quality concerns (especially regarding silty water) and control the rate of discharge, two temporary settlement lagoons are proposed. Further details of the settlement lagoons are provided in Chapter 5 (Construction & Commissioning) and the SWMP (Annex A of Appendix A5.1: CEMP). Following treatment, water from the settlement lagoons would be discharged to the Derg HMWB, thus ensuring water quality to the Derg HMWB would not be impacted.

57. Given the above, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

Intake Structure and Dewatering – Release of Potentially Polluting Materials

58. There are a number of potential pollutant pathways to the Derg HMWB. If a barge were to be used, a direct and short pathway to the Derg HMWB would exist as plant and machinery would be operating directly above the Derg HMWB. Similarly, there could also be a pathway for pollutants from any construction carried out on moored pontoons within the Derg HMWB. No refuelling of plant and machinery would take place on barges or moored pontoons and no fuel tanks would be stored on them. Therefore, the only potential sources would be leaking plant or machinery or leaks directly from the barge itself, or machinery used on moored pontoons, so the amount of oil that could be accidentally released is limited. However, given the short and direct pathway to the receptor, any leakages would be difficult to contain.

59. On the landward side there are several potential sources for the accidental release of fuels and oils. There would be fuel storage and refuelling locations within the construction site compound areas and a large number of plant and machinery. In terms of pathways, there would be a continuous hydrological linkage through the ‘gaps’ in the secant piled walls for a period until it is watertight. Given the dewatering activities, it is likely that the direction of flow would be from the Derg HMWB to the construction site, rather than the other way around. Therefore, the most likely pathway for oil spills would be via discharges from the settlement lagoons (>50m from the Derg HMWB, towards the east of the site), directly to the Derg HMWB.

60. An accidental release of potentially polluting cement may result in a deterioration to water quality including increases in pH. Were there to be a pathway, this can have a negative impact on any aquatic species present. Concrete and cement are highly alkaline and fresh concrete has corrosive properties. Concrete wash water is a particularly severe pollutant as it typically has a high pH and a high suspended sediment content. Given many of the structural elements involving concrete will be built using precast elements and only internal structures and secant piles will be constructed using in situ concrete, these potential impacts have been restricted.

61. Should there be a discharge of fuels and/or oils, wind effects could result in oil accumulating along the banks or, more importantly, the emulsification of oils which are heavier and could sink below the water surface and cover the bed.

62. Given the varying factors in relation to the size and nature of any oil spill, a reasonable assessment is that, in the absence of control or mitigation measures, an oil spill at this location has the potential to reach the Derg HMWB. As such, without mitigation in place, a high adverse magnitude of impact is assessed, resulting in a Profound (significant) effect.

Intake Structure and Dewatering – Increases in Silty Runoff

63. The installation of the RWI&PS in proximity to the Derg HMWB has the potential to result in sediment entering the Derg HMWB via silt-laden runoff or direct discharges during construction. Bare earth surfaces within the Planning Application Boundary, stockpiles of material and general excavation works would act as the key sources of fine sediment.

64. The most likely pathway for the silty water would be via the dewatering process. In the absence of control or mitigation measures, discharges would very likely be high in suspended solids. A discharge of water with high concentrations of suspended solids would give rise to localised adverse impacts on the water quality of the Derg HMWB. The Derg HMWB is primarily a lake, with a slow movement of water towards the outlet. As a result, heavier particulates in the water column would be more likely to be deposited and settle out onto the bed. This is most likely to occur at the boundary between land and water in the form of a plume which dissipates quickly. There are likely to only be temporary localised effects and is unlikely to spread further throughout the Derg HMWB.

65. Given the volumes of water proposed to be discharged and the size and dilution capacity of the Derg HMWB, the magnitude of impact would be likely to be low adverse. Therefore, the resulting significance of effect is assessed as Significant.

Wastewater Discharges

66. For the purposes of this assessment, wastewater is ‘domestic’ wastewater from welfare facilities. There would be no process discharges during construction of the RWI&PS. There are two potential sources of wastewater during construction: the barge that would bring materials to site, and wastewater arising from the welfare facilities provided for construction workers. Likely significant effects on water quality from boats as includes the following:

- Hydrocarbons
- Oily and bilge water
- Sewage and grey water
- Anti-fouling paints.

67. With respect to the barge, oil, bilge water and sewage would be contained within the barge itself and disposed of at appropriately licensed sites. Construction of the secant pile wall would require use of plant and machinery such as cranes and piling rigs. These would require fuel and the potential for spillage is as described earlier in this section (Intake Structure and Dewatering – Release of Potentially Polluting Materials). No refuelling of the barge or the equipment contained on it would be undertaken on the water; all refuelling would take place in port in designated areas (for the barge) and on land for the equipment on the barge. The hydrocarbons and anti-fouling paints would have a negligible magnitude of impact on the Derg HMWB and any downstream receptors. This results in a Not Significant effect.

68. With respect to the provision of welfare facilities at the construction site, wastewater would be contained in holding tanks on the site and periodically tankered off site and disposed of to a Wastewater Treatment Plant. There would be no discharge to the Derg HMWB.

69. There is potential for accidental releases of wastewater during the transfer from containment to tanker. Wastewater tankers are designed with cut-off valves to minimise this risk, and it is considered that this has a low probability of occurring. The magnitude of impact on the Derg HMWB would be negligible, resulting in a Not Significant effect.

5.2.4.1.2 Hydromorphology

Intake Structure and Dewatering

70. The intake structure would require removal of a length of the shoreline/bank for the Intake Chamber, as well as the removal of the lough bed and further bed and shoreline/bank along the Derg HMWB. On the outside of the Intake Chamber, flexible concrete revetment mats would extend out from the intake to prevent bed scour during operation. The material along the shoreline of the Derg HMWB would be removed as a direct result of the Intake Chamber. A number of trees and shrubs would also be permanently removed. However, these currently afford little stability to the banks which slope gradually into the Derg HMWB.

71. The potential for fine sediment input arising from bare earth surfaces, working within the area of the intake, excavation of the RWI&PS site and storage of materials, could lead to changes in bed substrate. An outfall from the settlement lagoons would also be required on the bank of the Derg HMWB. The outfall would have an associated headwall and be located directly south of the intake structure. The outfall structure would require permanent removal of a short length of the shoreline/bank to set the outfall back from the bank. A small length of riparian vegetation would also be permanently removed.

72. In summary, there would be the potential for changes to the hydromorphology of the Derg HMWB from removal of a length of bank and riparian vegetation, localised changes in flow and/or sediment processes and the dispersal of silt and sediment into the Derg HMWB. These impacts would be temporary and limited to the Construction Phase. Additionally, the Derg HMWB is large in area and would likely have sufficient dilution capacity to reduce impacts of silty runoff. Therefore, without mitigation the magnitude of impact is assessed as low adverse resulting in a Slight (not significant) effect.

5.2.4.2 Shannon (Lower)_050

5.2.4.2.1 Surface Water Quality and Hydrology

73. There is potential for impacts to the hydrology of the Shannon (Lower)_050 from discharges to the Derg HMWB. However, the additional flows from dewatering would not be significant in comparison to the overall inflows to the Derg HMWB and from various tributaries.

Potential Oil/Pollutant Spill

74. In addition to wind effects, flows through the Derg HMWB could affect the behaviour of any oil spill. The route of the ‘Old River Shannon’ at the centre of the Derg HMWB is an important hydrological mechanism and could result in oil being more quickly transported downstream to the Shannon (Lower)_050 and the Ardnacrusha Headrace, than might otherwise be expected in a more naturalised lacustrine environment.

75. Any oil/fuel on the surface of the Derg HMWB could reach the Shannon (Lower)_050 if in sufficient quantity and if it is not sufficiently diluted prior to Parteen Weir. Parteen Weir would provide a mechanism to slow any oil spill and capture much of the slick remaining on the surface. However, it is possible that some oil could pass over the weir. It is also possible that there would be amalgamation of oil droplets with sediment particles at the base of the weir due to mixing. This could provide an additional pathway through which oil particles could affect the quality of the water and sediment. Given that partial to full dilution could take place prior to the Shannon (Lower)_050 WFD designated water body, and that impacts would be temporary and confined to the Construction Phase, the magnitude of impact is assessed as medium adverse. This results in a Very Significant effect.

Increases in Silty Runoff

76. The Shannon (Lower)_050 could receive additional fine sediment delivered to the Derg HMWB from construction activities, e.g. discharge from the outfall or increased silty water runoff. However, much of the sediment delivered to the Derg HMWB would be deposited in close proximity to the outfall or works. The volume of sediment transported downstream out of the Derg HMWB would be minimal and remain as suspended sediment. It is likely to settle at the base of Parteen Weir and would not be deposited in downstream reaches. Therefore, the magnitude of impact is assessed as negligible. This results in a Not Significant effect.

5.2.4.2.2 Hydromorphology

77. The WFD designated Shannon (Lower)_050 and the non-WFD designated Ardnacrusha Headrace would not be affected by changes to channel morphology as inflows are already controlled under baseline conditions via Parteen Weir. These water bodies could receive additional fine sediment delivered to the Derg HMWB from construction activities, e.g. discharge from the outfall or increased silty water runoff. This has the potential to alter the structure and substrate of the bed, especially in the Shannon (Lower)_050. However, as described for water quality, there is unlikely to be a measurable change in baseline conditions. Therefore, the magnitude of impact is assessed as negligible. This results in a Not Significant effect.

5.2.4.3 Other Waterbodies in the Study Area

5.2.4.3.1 Surface Water Quality and Hydrology

78. Potential indirect impacts could arise from dewatering of excavation sites, or the diversion or ‘cut-off’ of land drains and ditches. During dry weather these activities could result in decreased groundwater levels, reducing recharge to local water bodies. This could lead to a reduction in flows outside of a normal low flow season, resulting in hydromorphological effects.

79. WBX002 and WBP396 would be crossed by the proposed RWI&PS access road in culverts. This would maintain flows below the access road. Additionally, given the local topography, flows would be from west to east, parallel to the access road, and remain unchanged from the baseline. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

80. WBP062 flows along the eastern boundary of the RWI&PS. Given the local topography, the direction of flow would be from east to west; as a result, normal flows to this water body from either surface or groundwater would not change. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

81. The following likely significant effects to Other Waterbodies may occur from the accidental release of oils and/or fuels and from silty water runoff:

    - WBX002: There are no direct impacts from the RWI&PS construction footprint as WBX002 is upslope of these works. There is potential for impacts from fuel and/or spillages of oil, concrete/cement and from sediment-laden runoff from construction of the access road and associated culvert. These impacts would be localised to the culvert footprint. Therefore, the magnitude of impact is assessed as medium adverse. This results in a Significant effect
    - WBP062: This water body is on the boundary between the RWI&PS footprint and the start of the Treated Water Pipeline from the BPT to the TPR. Topography in this location slopes from east to west towards Lough Derg. Therefore, any spillages of oil/fuels from construction of the RWI&PS would flow away from this water body. The magnitude of impact is assessed as medium adverse, resulting in a Significant effect
    - WBP396: There are no direct impacts from the RWI&PS construction footprint as WBP396 is upslope of these works. There is potential for impacts from fuel and/or spillages of oil, concrete/cement and from sediment-laden runoff from construction of the access road and associated culvert. These impacts would be localised to the culvert footprint. Therefore, the magnitude of impact is assessed as medium adverse. This results in a Significant effect.

5.2.4.3.2 Hydromorphology

82. There is potential for silty runoff to enter WBP062 from construction of the access road culvert and culverts below the construction compound; however, it is unlikely to be in sufficient quantities to cause a reduction in morphological form and/or process. Additionally, these water bodies are land drains with little to no morphological form under baseline conditions and therefore culvert construction is unlikely to remove any sensitive features. Therefore, the magnitude of impact is assessed as low adverse. This results in Not Significant to Slight (not significant) effects.

5.2.4.4 Summary of Construction Phase Effects

83. A summary of pre-mitigation Construction Phase likely significant effects is provided in Table 5.3.

Table 5.3: Pre-Mitigation Summary of Construction Phase Effects on Water Bodies within the RWI&PS Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Derg HMWB	Intake structure and dewatering of secant pile walls	Surface Water Quality and Hydrology	Dewatering of the secant pile walls	Very high	Negligible	Not Significant
			Release of potentially polluting materials	Very high	High adverse	Profound (significant)
			Increases in silty runoff	Very high	Low adverse	Significant
			Wastewater discharges	Very high	Negligible	Not Significant
		Hydromorphology	Removal of sections of shoreline and associated riparian vegetation on Parteen Basin	Medium	Low adverse	Slight (not significant)
			Release of silty runoff	Medium	Low adverse	Slight (not significant)
			Construction of outfall	Medium	Low adverse	Slight (not significant)
Shannon (Lower)_050 (Downstream of Parteen Weir)	Intake structure and dewatering of secant pile wall	Surface Water Quality and Hydrology	Dewatering flows	Very high	Negligible	Not Significant
			Oil/pollutant spill	Very high	Medium adverse	Very Significant
			Increases in silty runoff	Very high	Negligible	Not Significant
		Hydromorphology	Changes to channel morphology	Medium	Negligible	Not Significant
			Increases in silty runoff	Medium	Negligible	Not Significant
WBX002	Intake structure, dewatering of secant pile wall, construction of RWI&PS, and access road	Surface Water Quality and Hydrology	Dewatering of excavations, diversion of existing flow pathways	High	Negligible	Not Significant
			Release of potentially polluting materials	High	Medium adverse	Significant
			Increases in silty runoff	High	Medium adverse	Significant
		Hydromorphology	Increases in silty runoff	Low	Low adverse	Slight (not significant)

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
WBP062	Intake structure, dewatering of secant pile wall, construction of RWI&PS, and access road	Surface Water Quality and Hydrology	Dewatering of excavations, diversion of existing flow pathways	High	Negligible	Not Significant
			Release of potentially polluting materials	High	Medium adverse	Significant
			Increases in silty runoff	High	Medium adverse	Significant
		Hydromorphology	Increases in silty runoff	Negligible	Low adverse	Not Significant
WBP396	Intake structure, dewatering of secant pile wall, construction of RWI&PS, and access road	Surface Water Quality and Hydrology	Dewatering of excavations, diversion of existing flow pathways	High	Negligible	Not Significant
			Release of potentially polluting materials	High	Medium adverse	Significant
			Increases in silty runoff	High	Medium adverse	Significant
		Hydromorphology	Increases in silty runoff	Negligible	Low adverse	Not Significant

5.2.5 Construction Phase Mitigation

5.2.5.1 Site-Specific Mitigation

84. Mitigation specific to the RWI&PS is detailed in the SWMP (Annex A of Appendix A5.1: CEMP). This includes measures related to:
    - Construction sequencing (W-SC21)
    - Management of silt-laden water (W-SC22)
    - Construction compounds (W-SC23)
    - Secant Piles (W-SC24)
    - Concrete Revetment Mat (W-SC25).

5.2.5.2 Generic Mitigation

85. Generic mitigation measures for use across the Proposed Project are outlined in Section 4.3.

5.2.6 Construction Phase Residual Effects

86. Following implementation of mitigation and control measures, likely significant effects identified in Section 5.2.4 of this appendix would be reduced to Not Significant (see Table 5.4).

Table 5.4: Summary of Residual Effects as a Result of Construction within the RWI&PS Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
Derg HMWB	Intake structure and dewatering of secant pile wall	Surface Water Quality and Hydrology	Release of potentially polluting materials	Very high	High adverse	Profound (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
			Increases in silty runoff	Very high	Low adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
		Hydromorphology	Removal of sections of shoreline and associated riparian vegetation on Parteen Basin	Medium	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
			Release of silty runoff	Medium	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
			Construction of outfall	Medium	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
Shannon (Lower)_050 (Downstream of Parteen Weir)	Intake structure and dewatering of secant pile wall	Surface Water Quality and Hydrology	Oil/pollutant spill	Very high	Medium adverse	Very Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
WBX002	Intake structure, dewatering of secant pile wall and RWI&PS access road construction	Surface Water Quality and Hydrology	Release of potentially polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
			Increases in silty runoff	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff	Low	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
WBP062	Intake structure, dewatering of secant pile wall and RWI&PS access road construction	Surface Water Quality and Hydrology	Release of potentially polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
			Increases in silty runoff	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
WBP396	Intake structure, dewatering of secant pile wall and RWI&PS access road construction	Surface Water Quality and Hydrology	Release of potentially polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant
			Increases in silty runoff	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC21 to W-SC25	Negligible	Not Significant

5.2.7 Testing and Commissioning Phase Assessment of Effects

87. The RWI&PS would be one of the first elements of the Proposed Project to be tested and commissioned as the water required for the testing and commissioning of the WTP and High Lift Pumping Station (HLPS) would need to come from Parteen Basin (Derg HMWB).

88. Following dry inspection of the Intake, the PWWC screens, the penstocks, chambers and the wet wells would be flooded. The reprofiled area of Parteen Basin (Derg HMWB) bed, at the Raw Water Intake Basin, would be inspected by divers for integrity of the concrete revetment mats. The Intake would remain flooded, as far as closed penstocks on the Inlet Chambers, until the wet wells are flooded immediately prior to commissioning.

89. The microfiltration units and the UV units on the microfilter wash water return pipes would be wet commissioned first so that water pumped forward is free of invasive species. Water would be delivered to the microfiltration units from the RWI&PS pump hall by a temporary pump, appropriately sized. Water run through the microfiltration units would run waste into the RWRMs scour tanks, located beneath the microfiltration unit buildings. This water would be returned to the raw water inlet chambers and recycled through the microfiltration units until commissioning of those units is complete.

90. Pumps would then be commissioned individually and in parallel.

91. There are likely significant effects associated with the flooding of the intake area and removal of the secant pile walls, in so far as this would allow the mobilisation of any sediments in the area, into the Derg HMWB. Given the sequential approach to the excavation and backfilling of the construction areas, the levels of sediments at this stage of the process would be very low, the duration of the impact very short and the dilution effect from the Derg HMWB large. As a result, the magnitude of impact would be negligible; combined with the very high sensitivity of the Derg HMWB, the effect would be Not Significant.

5.2.8 Operational Phase Assessment of Effects

92. Details of the general layout and design for the RWI&PS are provided in Chapter 4 (Proposed Project Description). For the purposes of the Operational Phase impact assessment, the measures incorporated into the design of the RWI&PS to control surface water and avoid release of contaminated surface or waste/process water are considered to be part of the Proposed Project design rather than mitigation measures.

93. As a result of the designs set out in Chapter 4 (Proposed Project Description) and in brief in Section 2 (Project Components) of this appendix, no significant effects would occur as a result of the operation of the Proposed Project at the RWI&PS (as detailed in Table 5.5).

5.2.8.1 Surface Water Quality and Hydrology

94. An assessment of the likely significant effects on hydrology in relation to the operation of the RWI&PS is provided in Appendix A9.1 (Abstraction Assessment) and is therefore not repeated here.

95. The RWI&PS would be a ‘closed loop system’. There would be no discharge of RWRMs maintenance water from the RWI&PS back to the Derg HMWB. As a result of the closed system at the RWI&PS, there would be no impacts on the water quality of the Derg HMWB from any processes on the RWI&PS site.

96. During operation, there are a few likely sources of surface water quality contamination from the operation of the RWI&PS infrastructure, such as contaminated runoff from new impermeable areas (e.g. the access road) and potential release of pollutants from operation procedures. Rainfall runoff from roofs, roads and other impermeable areas would be conveyed to a Sustainable Drainage System (SuDS). Drainage from the new access road to the RWI&PS site from the R494 would be 'over the edge' to a hardcore longitudinal soakaway along both edges of the road.

97. On the RWI&PS site itself, rainwater from the roofs of the Raw Water Pumping Station Building and the two Microfiltration Buildings would be harvested and taken into the Intake Chambers and the Raw Water Rising Mains Scour Tank respectively. Other impermeable circulation areas would be drained to infiltration basins formed where the Construction Phase dewatering settlement lagoons are proposed to be located. This would then be discharged to the settlement lagoons via Oil Interceptors and then recirculated through the Raw Water Pumping Station Building into the treatment process.

98. Foul wastewater generated on the site would be contained and disposed of at a licensed Wastewater Treatment Plant.

99. Given the above, the magnitude of impact on Surface Water Quality is assessed as negligible for the Derg HMWB, resulting in a Not Significant effect.

5.2.8.2 Hydromorphology

100. Concrete revetment mats and gabion mattresses would alter lough substrate (in some places small areas of substrate would be lost). Therefore, the magnitude of impact is assessed as low adverse resulting in a Slight (not significant) effect.

101. The operation of permanent culverts on WBX002, WBP062 and WBP396 have the potential to cause changes to flow types, hydraulics and sediment transport regime whilst reducing lateral and longitudinal connectivity, which would increase erosion upstream and downstream initiating change in channel planform and sediment regime. These impacts would start locally to the culvert but have the potential to propagate upstream and downstream. Therefore, the magnitude of impact is assessed as medium adverse, resulting in a Slight (not significant) effect for WBX002, and a Not Significant effect for WBP062 and WBP396.

Table 5.5: Summary of Pre-Mitigation Operational Phase Effects on Water Bodies within the RWI&PS Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effects (Pre-Mitigation)
Derg HMWB	Outfall: rainfall runoff and access road drainage	Surface Water Quality and Hydrology	Increases in silty runoff and potentially polluting materials	Very high	Negligible	Not Significant
		Hydromorphology	No impacts anticipated	Medium	N/A	N/A
	Operation of the Raw Water Intake (excluding abstraction)	Surface Water Quality and Hydrology	Increases in silty runoff and potentially polluting materials	Very high	Negligible	Not Significant
		Hydromorphology	Prevent the growth of some emergent macrophytes along the immediate shoreline	Medium	Low adverse	Slight (not significant)
WBX002	Permanent culverts	Surface Water Quality and Hydrology	No impacts anticipated	High	N/A	N/A
		Hydromorphology	Change in channel planform and sediment regime	Low	Medium adverse	Slight (not significant)
WBP062	Permanent culverts	Surface Water Quality and Hydrology	No impacts anticipated	High	N/A	N/A
		Hydromorphology	Change in channel planform and sediment regime	Negligible	Medium adverse	Not Significant
WBP396	Permanent culverts	Surface Water Quality and Hydrology	No impacts anticipated	High	N/A	N/A
		Hydromorphology	Change in channel planform and sediment regime	Negligible	Medium adverse	Not Significant

5.2.9 Operational Phase Mitigation and Residual Effects

102. Design embedded mitigation described in Section 5.2.1.2 would avoid long-term significant impacts as a result of the operation of the RWI&PS. It is possible that there may be some short-term impacts on the hydromorphology of WBX002 in the immediate vicinity of the RWI&PS. However, once the bed of the lough has re-established and mitigation for culverts applied (detailed in the SWMP (W-SO3)), there would be no significant effects. Therefore, no further mitigation measures are required and there would be no residual effects (see Table 5.6).

Table 5.6: Operational Phase Residual Effects on Water Bodies within the RWI&PS Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
Derg HMWB	Operation of the Raw Water Intake (excluding abstraction)	Hydromorphology	Prevent the growth of some emergent macrophytes along the immediate shoreline	Medium	Low adverse	Slight (not significant)	N/A (would re-establish itself over time).	Negligible	Not Significant
WBX002	Permanent culverts	Hydromorphology	Change in channel planform and sediment regime	Low	Medium adverse	Slight (not significant)	W-SO3	Negligible	Not Significant

5.3 Water Treatment Plant

5.3.1 Overview

103. Details of the design and construction of the WTP are provided in Chapter 4 (Proposed Project Description) and Chapter 5 (Construction & Commissioning). A brief description is provided here for ease of reference. See A9.3 Figure 6 for the WTP study area.

104. The main elements of the WTP include:

- Water Treatment Module Buildings
- Raw Water Balancing Tanks
- Sludge Storage Buildings
- Sludge Dewatering Buildings, with adjacent holding tanks and sludge silos
- HLPS and Surge Vessels
- Control Building and Visitor Centre, incorporating workshop and welfare facilities
- Access road and bridge.

5.3.1.1 Access

105. It is proposed to construct a new permanent access road in a south–north orientation from the existing R445. The proposed access road would be 6m in width and approximately 640m in length. The proposed access road would include the installation of a clear span bridge over the Roran water course (part of the WFD designated Kilmastulla_050 water body) and box culverts within the floodplain beneath the road. There would be 52 car parking spaces provided on the WTP site.

5.3.1.2 Design

5.3.1.2.1 The Treatment Process

106. The proposed works include the treatment and recycling of process water streams, arising from settlement tank sludge bleeds, filter backwash water, filter ‘run to waste’ flows, and supernatants from the sludge thickening and dewatering processes. This includes a process water balancing sump and pumping station, a wash water settlement lamella clarifier building including lamella clarifier units, a static mixer and an ultraviolet unit.

107. Two Tank Draindown Management and Commissioning Lagoons, each with a capacity of 15,000m^3, would be provided for commissioning purposes, for drawing down of an RWRM or other water tank, for acceptance of surface water, or for emergency storage of wash water. Each lagoon has an associated pumping station to allow the contents to be recirculated to the Raw Water Balancing Tanks.

108. Process waters from the treatment process would not be discharged back to the environmentally sensitive Lower River Shannon SAC. The process waters generated in the treatment process itself would be treated on-site and recirculated through the WTP. The volume of recirculated water is variable; it depends on filter backwash frequency, the length of the 'run to waste' cycle and the rate of sludge generation in the settlement tanks. A full description of the management of these flows is provided in Appendix A4.1 (Operational Strategy).

109. All chemicals stored on-site would be held in bunded areas, as close as possible to the final dosing points. A Stormwater Attenuation Pond is proposed to treat and attenuate runoff from surfaces not subject to rainwater harvesting as further discussed in Appendix A4.1 (Operational Strategy).

5.3.1.2.2 Surface Water Management – WTP Site

110. Building roofs and tank covers account for approximately 55% of the impervious area of the WTP site. Rainfall runoff from these particular surfaces is considered to be of sufficiently consistent quality to be harvested as a source of raw water. Roof and tank cover runoff would be collected in a dedicated separate pipe network which would outfall into the commissioning lagoons and would ultimately be pumped to the Raw Water Balancing Tanks.

111. Harvesting rainwater in this manner would reduce stormwater runoff from the WTP site that would otherwise have to be managed, and would marginally reduce the volume of pumping required from the RWI&PS. Drainage pipework would therefore be designed for two separate networks: harvested runoff would drain to the commissioning lagoons, and general site runoff from internal roads would be taken to an attenuation pond in the south-eastern corner of the WTP site. The surface water drainage and its operation are described in more detail in Appendix A4.1 (Operational Strategy).

112. The commissioning lagoons and the associated return pumping system have been appropriately sized for the probability of extreme rainfall events (1 in 100-year return event with 30% allowance for climate change, in accordance with a High End Future Scenario) occurring concurrently with commissioning or operational requirements.

113. The WTP access road would be allowed to drain via filter drains running on either side of the road. Pea-gravel is a permeable material and would allow storage of excess rainwater before it infiltrates into the subsoil and would also act as a filter medium for runoff containing increased suspended solids. This process replicates the existing greenfield drainage regime on the site.

114. Roads and hard-standing working areas within the site would be drained via a gully and pipe system. Two main arterial surface water pipelines are proposed. Both surface water pipelines would terminate at an attenuation pond at the south-eastern corner of the site, adjacent to the access road. The purpose of the attenuation pond is to attenuate runoff to greenfield runoff rates. The attenuation pond would be planted with vegetation and the bed slope would be limited to 1:100. The principal water quality benefits of vegetated detention basins are associated with the removal of sediment and buoyant materials, but levels of nutrients, heavy metals, and oxygen-demanding material can also be removed if present.

115. Runoff entering the attenuation pond would be pre-treated in a Class 2 By-Pass Hydrocarbon Interceptor. This allows for any build-up of pollutants on an internal roadway or working surface that would be washed off in the early part of a storm to be treated. The outfall from the attenuation pond would be fitted with a penstock which can be used to isolate the attenuation pond and so contain pollutants in the event of an accidental spillage.

116. Stormwater from the attenuation pond would be discharged into a manhole at the head of the WTP access road. This manhole would contain a flow control device which would control discharge from the system, limiting it to the maximum flow that would be expected from the greenfield site. Stormwater runoff would be conveyed by a stormwater drain running along the route of the WTP access road to discharge into the Kimastulla_050 immediately north of its junction with the R445 public road.

117. Foul wastewater generated on the WTP site, which is estimated at approximately 1m³/d in normal operation and 2.4m³/d with visitors to the site, would be collected in a wastewater tank and tankered to a licensed Wastewater Treatment Plant.

5.3.2 Construction

118. Full details of the construction of the WTP are provided in Chapter 5 (Construction & Commissioning). Brief details, of relevance to this assessment, are provided here.

119. Whilst the description of works in Section 5.3.2.1 and Table 2.1 of Section 2 (Project Components) is considered to be embedded mitigation, for the purposes of the assessment, control measures and approaches set out in this section are described for ease of reference but are considered to be mitigation and are not considered to be in place for the initial assessment. Any mitigation measures identified here are provided in more detail in the SWMP (Annex A of Appendix A5.1: CEMP).

5.3.2.1 Construction Main Elements

120. The main elements and sequence of construction activities are provided in Table 5.7 along with additional information relevant to this assessment.

Table 5.7: WTP Construction Main Elements

Sequence	Construction Activity	Further Details (of Relevance to Assessment)
1.	Site preparation works	• Access road requires demolition and removal of former petrol station on banks of Kilmastulla_050 • Proposed works include cleaning out and backfilling the tanks with either sand and cement or foam concrete.
2.	Construction of clear span bridge over the Roran watercourse (part of the Kilmastulla_050 WFD designated water body) and construction of flood relief box culverts within the Kilmastulla_050 floodplain.	• The bridge would be clear span and would not interact with the channel bed • The box culverts would be formed with precast concrete boxes inserted into the floodplain. This would take place in the dry during normal flows and would not require a dry working area on/in the Kilmastulla_050.
3.	Topsoil stripping	• Topsoil would be stripped across the required site area to its full depth • Any existing land drains crossing the works area would be recorded and culverted.
4.	Earthworks to reduce existing high ground levels in the western and eastern areas of the site and raise levels at locations of the Water Treatment Module Buildings. Construction of Tank Draindown Management and Commissioning Lagoons.	• Earthworks would be required to reduce areas of existing high ground levels in the western and eastern sections of the WTP site and raise levels at the locations of the Water Treatment Module Buildings • Suitable excavated material would be reused on-site for cut and fill operations and reprofiling the site. This material would be selected and managed for storage, and consolidated properly at the correct moisture content, and soils at source would be verified as free of contamination arising from any previous land use, before being reused • The locations of the Tank Draindown Management and Commissioning Lagoons would also be excavated and formed early and lined with a permeable liner, working as settlement lagoons for surface water drainage from exposed excavations and for dewatering flows. The material from these earthworks and the subsequent excavation for the construction of these tanks would be used to raise levels around the site where the Water Treatment Module Buildings would be constructed.

Sequence	Construction Activity	Further Details (of Relevance to Assessment)
5.	Installation of site drainage. Raising of levels at treatment buildings using excavated material.	• The appointed Contractor would 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 would be relied upon to act initially as efficient construction site drainage/settlement lagoons. This would 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 would be consistent with the necessary sequence of construction of the various units • Contour draining of the WTP site would be employed which would partition the upper undisturbed soil areas of units to be built later and would direct their drainage around the construction site to the natural drainage system. This would partition clean areas of the site from the working areas whose runoff would be managed through the lagoons.
6.	Construction of above ground WTP infrastructure including Backwash Water Tank and Pumping Station, Clear Water Storage Tanks, HLPS, Filter 'Run to Waste' Equalisation and Settlement Tanks and Filtrate Tanks, Water Treatment Module Buildings, Sludge Dewatering Buildings and Sludge Storage Buildings.	N/A
Throughout	Concrete batching	• The concrete mixing drum on the batch plant must be cleaned, by rinsing the sides of the drum into a 'lagoon' where washings are left to 'stabilise' • After 7-10 days, the weak concrete residue left behind would be broken out and the material can subsequently be used as a general fill under roads and buildings elsewhere on the site.
Throughout	Potable water provision	• The permanent water supply to the WTP would be constructed as part of the site establishment and so would also act as the temporary water supply needed during construction. This would be made from the existing 100mm diameter watermain located on the R445 Regional Road. The connection would be constructed in conjunction with the new permanent access road to the WTP. • Demand for potable water for use by construction staff, and potentially in concrete production on-site at the batching plant, would likely exceed the capacity of the temporary water connection which would be taken along the access road from the public mains. If demand does exceed the capacity, then the potable water supply from the temporary water connection would be reserved for site staff and would be supplemented with on-site storage tanks filled overnight from the potable supply and the use of water bowsers.

5.3.3 Study Area and Baseline Conditions

121. As a result of the site selection process for the WTP (see Chapter 3: Consideration of Reasonable Alternatives), there are very few water bodies within the study area for the WTP (see Table 5.8). There are two drains within the boundary of the WTP site (WBX090 and WBP063). The access road would cross two field drains (WBP221 and WBX004) and, more significantly, the Roran watercourse (part of the Kilmastulla_050 WFD designated water body) (WCX002). The proposed crossing is immediately upstream of the boundary of the Lower River Shannon SAC.

Table 5.8: Summary of Baseline Conditions of Water Bodies within the WTP Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Kilmastulla_050 (WCX002)	Moderate	At Risk	The Kimastula_050 is a WFD designated water body of Moderate status. The crossing location is within the Lower Shannon SAC. The water body forms a low to moderately sinuous planform with an abundance of morphological features including riffles, runs, glides, pools and bars. Active localised bank erosion alongside morphological features and processes suggests a morphologically active river. Anthropogenic pressures include culvert and bridge crossings via roads and field access tracks. No known abstractions and no pathways downstream (within 5km) to a water body within a DWPA.	High	High
WBX090	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. Straightened/modified planform with limited fluvial processes. No known abstractions and no potential pathway downstream to a water body within a DWPA.	High	Low
WBP063	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. Receptor is a drain with no morphological features or processes and likely to dry up in summer months. No known abstractions and no potential pathway downstream (within 5km) to a water body within a DWPA.	High	Negligible
WBX004	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. The ditch upstream of the WFD designated water body is Straightened/modified planform with limited fluvial processes. No known abstractions and no pathway downstream (within 5km) to a water body within a DWPA.	High	Low
WBP221	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. Water body is a drain with no morphological features or processes and likely to dry up in summer months. No known abstractions and no pathway downstream (within 5km) to a water body within a DWPA.	High	Negligible

5.3.4 Construction Phase Effects

5.3.4.1 Kilmastulla_050

5.3.4.1.1 Surface Water Quality and Hydrology

Installation of Clear Span Bridge and Flood Relief Culverts

122. The installation of the clear span bridge over the Roran watercourse (part of the Kilmastulla_050 WFD designated water body) to facilitate the access road to the WTP site is not anticipated to have any impacts to the volume or speed of flows as these would be maintained through the structure. The bridge is designed to be set above the 0.1% Annual Exceedance Probability flood event water level with 300mm of freeboard so would not impact upon the hydrology of the Roran watercourse and therefore the Kimastulla_050. Therefore, the magnitude of impact is assessed as negligible. This results in a Not Significant effect.

123. There is a requirement to provide additional floodplain continuity next to the proposed clear span bridge structure. This would involve constructing the flood relief box culverts within the Kilmastulla_050 floodplain. These would be constructed offline from the Kilmastulla_050 channel in normal flow conditions and would not require the provision of a dry working area. The magnitude of impact is assessed as negligible resulting in a Not Significant effect.

124. The bridge would be constructed as a single span structure using precast concrete or steel sections. The bridge abutments would be set at least 5m back from each bank of the water body. No in-stream works are anticipated.

125. Construction adjacent to and on the banks of the Kilmastulla_050 could increase silty runoff as a result of excavations and plant and machinery working adjacent to and on the bank tops. This has the potential to enter the water body and reduce baseline water quality. This would be a temporary impact localised to the works footprint. Additionally, the Kimastulla_050 is a relatively large water body in this location and would likely have additional capacity to dilute runoff should it enter. However, given the proximity of the works to the Kilmastulla_050, the magnitude of impact is assessed as medium adverse, resulting in a Significant effect.

Construction Compound and Drainage

126. There is potential for indirect impacts on flow from increased surface water discharges from the WTP site during construction. These would be localised to works areas and temporary over the Construction Phase. Additionally, given the distance from the main site works, drainage of the surrounding land would be unchanged from the baseline. Therefore, a negligible magnitude of impact is predicted, resulting in a Not Significant effect.

127. Surface water on the WTP site and in the Construction Compound area would be discharged indirectly to the Kilmastulla_050 via field drains close to the site and the installation of what would eventually be a permanent outfall. As a result of this, there is potential for silty water from construction works and contamination from concrete batching (with potential for changes in water pH) and/or accidental releases of oil or chemicals to enter the water body. The water body is approximately 650m from the WTP site boundary at its closest point which would allow a degree of settlement of suspended solids and attenuation of accidental spills prior to discharge to the Kilmastulla_050.

128. Given the above, the magnitude of impact is assessed as low adverse. This results in a Moderate (significant) effect.

Removal of Disused Petrol Station

129. The construction of the clear span bridge on the Roran watercourse (part of the Kilmastulla_050 WFD designated water body) would be within the vicinity of a disused petrol station. Given the nature of the historic land use there is potential for contaminated land to be encountered, from which contaminants could enter water bodies via runoff. Ground Investigation surveys undertaken in 2021 tested the soil on and surrounding the site and found no evidence of contamination. Soil and water samples were also obtained in 2021 from the Kimastulla_050 within the vicinity of the petrol station, and results indicate no contamination in the water or the banks of the water body at this location.

130. Although no contaminants have been identified during the ground investigation, there is still potential for contaminants to be mobilised during removal of the petrol station and associated tanks due to ground disturbance. Pollutants in the soil could be mobilised and a pathway to the water body created through groundwater flow or via surface water runoff; this may lead to a reduction in surface water quality. This impact would likely be localised to the construction works but occur over the medium-term should contaminants leach slowly from the site. Therefore, the magnitude of impact is assessed as high adverse, resulting in an adverse Very Significant effect.

5.3.4.1.2 Hydromorphology

Installation of Clear Span Bridge and Flood Relief Culverts

131. The bridge over the Kilmastulla_050 would be clear span and the flood relief culverts would be installed in the floodplain. Therefore, no direct impacts to the channel morphology and flow processes are anticipated.

132. Works to construct the bridge would require modifications to the floodplain for the bridge abutments and would also require works within 5m of the channel banks. Works to construct the flood relief culverts would require removal of riparian vegetation within the floodplain.

133. These activities have the potential to generate silty runoff which could enter the channel, altering the structure and substrate of the bed and leading to smothering of morphological features. Additionally, modifications to the channel bed and banks, including loss of bed and removal of riparian vegetation, could increase bank erosion. Such impacts would be localised to the works footprint but, given the need to work adjacent to and on the banks of the channel, the magnitude of impact is assessed as low adverse, resulting in a Moderate (significant) effect.

5.3.4.2 Other Waterbodies WBX090, WBX004, WBP063 and WBP221

5.3.4.2.1 Surface Water Quality and Hydrology

134. There would be some limited direct impacts on hydrology at the WTP site during construction resulting from the culverting and diversion of land drains/field ditches, including WBX090 and WBP063, and the addition of surface water discharges during construction to a local field ditch which drains to the Kilmastulla_050. Potential indirect impacts could also occur due to the dewatering of excavation sites, or the diversion or ‘cut-off’ of land drains and ditches. During dry weather these activities could result in lower groundwater levels, reducing recharge to local water bodies, leading to a reduction in flows in the water bodies outside of a normal low flow season. However, these impacts would be at a local scale and temporary over the Construction Phase. Therefore, the magnitude of impact is assessed as negligible, resulting in a significance of effect that is Not Significant.

135. In addition to the crossing of the Kimastulla_050, there would be a requirement to cross WBP221 and WBX004 to facilitate the new WTP access road. It is assumed for the purposes of this assessment that the water bodies would be culverted below the proposed access road, given their size. The installation of a culvert on WBX004 and WBP221 for the construction of the access road to the WTP site is not anticipated to have any impacts in the volume or speed of flows as these would be maintained through over-pumping or fluming around the site. This would avoid disruption of flows downstream of the dry working area and so would not affect water body hydrology. Therefore, the magnitude of impact is assessed as negligible. This results in a significance of effect of Not Significant.

136. There is potential for silty water from the construction activities outlined in Table 5.7 and contamination from concrete batching (from the temporary mobile concrete batching plant on-site) or accidental releases of oil or chemicals to reach the field drains close to the WTP site. The installation of culverts on WBX004, WBP221, WBP063 and WBX090 would likely be carried out by temporarily damming the water body and over-pumping or fluming flow to create a dry area in which work can be carried out.

137. Working in-stream in this manner has the potential to create significant levels of silty water which would need to be pumped from the 'dry' area. In addition, following completion of the installation, there is potential for a build-up of sediment to be released following removal of the dam. This would be a temporary and localised impact during and immediately after construction until the water body returns to baseline conditions. The magnitude of impact is assessed as medium adverse, resulting in a Significant effect for WBX004, WBP221, WBP063 and WBX090.

5.3.4.2.2 Hydromorphology

138. There is potential for increased sediment in local field drains and ditches WBX090 and WBP063 as a result of discharges from the WTP site during construction. The installation of culverts on WBX090, WBP063, WBX004 and WBP221 would likely be carried out using a temporary dam of the water body with over-pumping or fluming flow. This would create a dry area in which work can be undertaken. Working in-stream in this manner has the potential for the following impacts on the hydromorphology of the water bodies:

- Release of silty runoff
- Damage and modifications to the bed and banks
- Changes to flow regime from over-pumping/fluming.

139. Installation of the culverts would require some excavation of the banks and channel bed and temporarily constrain the channel dimensions. This would cause a release of fine sediments that could cause smothering of downstream bed substrate and hydromorphological features. There would also be a loss of hydromorphological features (if present) over the footprint of the excavation location as well as loss of natural bed footprint.

140. The impacts resulting from changes to the flow regime of the water body would include the potential build-up of sediment, leading to localised changes in the stream bed and localised scouring. Such impacts would be temporary, limited to the Construction Phase and localised to the works footprint. As such, the magnitude of impact is assessed as high adverse. This results in a Moderate (significant) effect for WBX004 and WBX090 and would be Not Significant for WBP221 and WBP063.

5.3.4.3 Summary of Construction Phase Effects

141. A summary of the potential construction impacts is provided in Table 5.9.

Table 5.9: Pre-Mitigation Summary of Construction Phase Effects on Water Bodies within WTP Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Kilmastulla_050 (WCX002)	Installation of clear span bridge and flood relief culverts	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways, volume, and/or velocities	High	Negligible	Not Significant
			Increases in silty runoff	High	Medium adverse	Significant
		Hydromorphology	Increases in silty runoff, modifications of sections of bank and associated riparian vegetation	High	Low adverse	Moderate (significant)
	Construction compound and drainage	Surface Water Quality and Hydrology	Indirect impacts on flow due to increased runoff	High	Negligible	Not Significant
			Discharge of construction drainage, including silty runoff	High	Low adverse	Moderate (significant)
		Hydromorphology	No impacts anticipated	High	N/A	N/A
	Removal of disused petrol station	Surface Water Quality and Hydrology	Mobilisation of contaminants	High	High adverse	Very Significant
		Hydromorphology	No impacts anticipated	High	N/A	N/A
	Construction of new outfall	Surface Water Quality and Hydrology	Discharge of construction drainage, including silty runoff	High	Low adverse	Moderate (significant)
		Hydromorphology	Increases in silty runoff, modifications of sections of bank and associated riparian vegetation	High	Low adverse	Moderate (significant)

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
WBX090	Culverting/realignment and temporary construction discharge	Surface Water Quality and Hydrology	Changes in flow pathways and recharge	High	Negligible	Not Significant
			Release of silty runoff and potential polluting materials	High	Medium adverse	Significant
		Hydromorphology	Release of silty runoff Damage and modifications to the bed and banks Changes to flow regime as a result of over-pumping/fluming	Low	High adverse	Moderate (significant)
WBP063	Culverting/realignment and temporary construction discharge	Surface Water Quality and Hydrology	Changes in flow pathways and recharge	High	Negligible	Not Significant
			Release of silty runoff and potential polluting materials	High	Medium adverse	Significant
		Hydromorphology	Release of silty runoff Damage and modifications to the bed and banks Changes to flow regime as a result of over-pumping/fluming	Negligible	High adverse	Not Significant
WBX004	Culverting Other Waterbody	Surface Water Quality and Hydrology	Changes in flow pathways and recharge	High	Negligible	Not Significant
			Release of silty runoff and potential polluting materials	High	Medium adverse	Significant
		Hydromorphology	Release of silty runoff Damage and modifications to the bed and banks Changes to flow regime as a result of over-pumping/fluming	Low	High adverse	Moderate (significant)

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
WBP221	Culverting of Other Waterbody	Surface Water Quality and Hydrology	Changes in flow pathways and recharge	High	Negligible	Not Significant
			Release of silty runoff and potential polluting materials	High	Medium adverse	Significant
		Hydromorphology	Release of silty runoff Damage and modifications to the bed and banks Changes to flow regime as a result of over-pumping/fluming	Negligible	High adverse	Not Significant

5.3.5 Construction Phase Mitigation

5.3.5.1 Site-Specific Mitigation

142. Mitigation specific to the WTP is detailed in the SWMP (Annex A of Appendix A5.1: CEMP). This includes measures related to:

- Construction sequencing (W-SC26)
- Access road (W-SC27)
- Control of silt-laden water (W-SC28)
- Construction compounds (W-SC29).

5.3.5.2 Generic Mitigation

143. Generic mitigation measures for use across the Proposed Project are outlined in Section 4.3.

5.3.6 Construction Phase Residual Effects

144. Following implementation of mitigation and control measures, likely significant effects identified in Section 5.3.4 would be reduced to Not Significant (see Table 5.10).

Table 5.10: Summary of Residual Effects as a Result of Construction within the WTP Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
Kilmastulla_050 (WCX002)	Installation of clear span bridge and flood relief culverts	Surface Water Quality and Hydrology	Increases in silty runoff	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff, modifications of sections of bank and associated riparian vegetation	High	Low adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
	Construction compound and drainage	Surface Water Quality and Hydrology	Discharge of construction drainage including silty runoff	High	Low adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
	Removal of disused petrol station	Surface Water Quality and Hydrology	Mobilisation of contaminants	High	High adverse	Very Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
	Construction of new outfall	Surface Water Quality and Hydrology	Discharge of construction drainage, including silty runoff	High	Low adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff, modifications of sections of bank and associated riparian vegetation	High	Low adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
WBX090	Culverting/ realignment and temporary construction discharge	Surface Water Quality and Hydrology	Release of silty runoff and potential polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
		Hydromorphology	Release of silty runoff Damage and modifications to the bed and banks Changes to flow regime as a result of over-pumping/fluming	Low	High adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
WBP063	Culverting/ realignment and temporary construction discharge	Surface Water Quality and Hydrology	Release of silty runoff and potential polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
WBX004	Culverting of Other Waterbody	Surface Water Quality and Hydrology	Release of silty runoff and potential polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
		Hydromorphology	Release of silty runoff Damage and modifications to the bed and banks Changes to flow regime as a result of over-pumping/fluming	Low	High adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant
WBP221	Culverting of Other Waterbody	Surface Water Quality and Hydrology	Release of silty runoff and potential polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC26 to W-SC29	Negligible	Not Significant

5.3.7 Testing and Commissioning Phase Assessment of Effects

145. Commissioning and test water for the WTP would be provided from Parteen Basin (Derg HMWB) via the RWI&PS and the RWRMs.

146. Following cleaning and dry inspection of all tanks, penstocks and chambers, the Raw Water Balancing Tanks would be filled by forward pumping from the RWI&PS.

147. Initial testing and commissioning (Stage 1) of the WTP would be carried out incrementally and using only a fraction of the ultimate flow. Commissioning would be possible, in the initial first stage, at a low rate (approximately 10Ml/d) and initially it would re-circulate that water. This would be done by discharging the treated water to one cell of the Clear Water Tanks (CWTs), and rather than pumping it forward to the BPT, it would be drained back to the Tank Draindown Management and Commissioning Lagoons on site and recirculated to the Raw Water Balancing Tanks at the head of the works.

148. When the water quality has reached a sufficient standard, it would be used initially as test water for tanks throughout the WTP site, and finally the through flow would be allowed to discharge forward to the CWTs, available for testing and commissioning of the HLPS. For the rest of the process commissioning, flows would gradually be increased (by activating further treatment sub-streams) until two full streams are operational.

149. The second stage involves gradually increasing flows from 10Mld to 20Mld and flows at this level would be monitored and increased as required so that the flow from one full treatment module would be available for the commissioning of the Treated Water Pipeline from the WTP to the BPT and the HLPS.

150. The same procedure would be followed with a second and third treatment module.

151. The Treated Water Pipeline from the WTP to the BPT would be swabbed, tested, chlorinated and commissioned, and the high lift pumps would be then commissioned individually and in parallel. The WTP site lagoons have adequate capacity to store the water volume in the Treated Water Pipeline from the WTP to the BPT to the first local high point downstream of the WTP.

152. Likely significant effects on water levels and flows in the Derg HMWB are similar to those described in the Operational Phase Impact Assessment, but with a negligible magnitude. The effect would be Not Significant.

153. The WTP process has been designed as a closed system, with no discharges from the process to water bodies. This principle applies to the testing and commissioning stage also; there would be no discharges during testing and commissioning. If water quality tests are failed, the water would be recirculated back through the treatment process until it is of the appropriate standard for onward flow.

5.3.8 Operational Phase Assessment of Effects

5.3.8.1 Kilmastulla_050

5.3.8.1.1 Surface Water Quality and Hydrology

WTP Site Drainage

154. As described in Section 5.3.1.2.2, the attenuation pond has been designed to discharge to the outfall on a proposed stormwater drain and eventually to a field drain. This will provide a direct pathway to the WFD designated Kilmastulla_050 at the south-east corner of the site at greenfield runoff rates. As such, there would be no impact downstream on the hydrology of the Kilmastulla_050.

155. Following the treatment process set out in Section 5.3.1.2, only uncontaminated surface water would be discharged to the Kilmastulla_050 via the new outfall. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

WTP Access Road

156. The access road bridge has been designed to allow and avoid obstructions to flows in the Kilmastulla_050. There would be no additional drainage to the water body from the access road, which would be drained via an 'over the edge drainage system' into a filtration material consisting of pea-gravel. As a result, no impacts are anticipated on the hydrology of the water body from this activity in operation.

157. There are no discharges proposed in relation to the access road or the bridge and, as a result, no potential for impacts on surface water quality to occur.

5.3.8.1.2 Hydromorphology

WTP Access Road

158. The access road to the WTP would require construction of a clear span bridge on the Roran watercourse (part of the Kilmastulla_050 WFD designated water body). Given that the bridge is clear span, it would not interact with the channel bed and bank during operation and would not alter pass-forward flow. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

5.3.8.2 Other Waterbodies

5.3.8.2.1 Surface Water Quality and Hydrology

159. The WTP would be located within an area of agricultural land, with field drains and ditches currently crossing the footprint of the site. These would be culverted and would discharge into an outfall at the head of the access road. There would be a change to the hydrology of these drains as they would be culverted and form part of the site drainage system. However, the hydrology of the drains to which the drainage system would drain to would not alter, as rates would be restricted to existing greenfield runoff rates.

160. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect for WBP063 and WBX090.

161. WBX004 and WBP221 would be in culverts below the proposed access road and flows would be maintained downstream. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect for WBX004 and WBP221.

162. Following treatment on the WTP site, water would discharge to a proposed stormwater drain and eventually to a field drain with a direct pathway to the Kilmastulla_050 at the south-east corner of the site. Only treated surface water runoff would discharge to the Kimastulla_050. There would be no discharges to Other Waterbodies. As a result, no impacts on water quality are anticipated.

5.3.8.2.2 Hydromorphology

163. The culverting and encompassment of WBX090 and WBP063 into the surface water drainage system of the WTP would result in a permanent loss of these water bodies. The receptors are ditches that are currently actively managed and display limited to no morphological features and/or process. Given the existing baseline, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect for WBX090 and WBP063.

164. WBX004 and WBP221 would have permanent culverts below the proposed WTP access road. Culverts have the potential to impact the hydromorphology of the water bodies through the following:

- Increased flow velocities through the culvert, leading to increased erosion downstream
- Permanent removal of morphological features and natural bed and bank material below the culvert footprint
- Loss of lateral and longitudinal connectivity with subsequent impact on sediment and ecological continuity.

165. The culvert lengths on WBX004 and WBP221 would at minimum be as long as the proposed access road width (approximately 6m). However, unsuitable culvert design could lead to the impacts outlined above. Therefore, the magnitude of impact is assessed as medium adverse, resulting in a Slight (not significant) effect for WBX004 and a Not Significant effect for WBP221 (given the lack of morphological features under baseline conditions).

5.3.8.3 Summary of Operational Phase Effects

166. A summary of the potential operational effects is provided in Table 5.11.

Table 5.11: Summary of Pre-Mitigation Operational Phase Effects on Water Bodies within WTP Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Kilmastulla_050 (WCX002)	WTP site drainage	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways, volume, and/or velocities	High	N/A	N/A
			Discharge of treated runoff from WTP site	High	Negligible	Not Significant
	WTP access road	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways, volume, and/or velocities	High	N/A	N/A
			Discharges as a result of road drainage	High	N/A	N/A
		Hydromorphology	Operation of clear span bridge	High	Negligible	Not Significant
WBX090	Culverting and incorporation with WTP site drainage	Surface Water Quality and Hydrology	Changes in flow pathways/volumes	High	Negligible	Not Significant
			Discharges of runoff from WTP site	High	N/A	N/A
		Hydromorphology	Permanent loss of features	Low	Negligible	Not Significant
WBP063	Culverting and incorporation with WTP site drainage	Surface Water Quality and Hydrology	Changes in flow pathways/volumes	High	Negligible	Not Significant
			Discharges of runoff from WTP site	High	N/A	N/A
		Hydromorphology	Permanent loss of features	Negligible	Negligible	Not Significant
WBX004	Operation of new culvert	Surface Water Quality and Hydrology	Changes in flow pathways and recharge	High	Negligible	Not Significant
			Discharges of runoff from WTP site	High	N/A	N/A
		Hydromorphology	Increased bed and bank erosion, permanent removal of morphological features and changes to morphological process	Low	Medium adverse	Slight (not significant)
WBP221	Operation of new culvert	Surface Water Quality and Hydrology	Changes in flow pathways and recharge	High	Negligible	Not Significant
			Discharges of runoff from WTP site	High	N/A	N/A
		Hydromorphology	Increased bed and bank erosion, permanent removal of morphological features and changes to morphological process	Negligible	Medium adverse	Not Significant

5.3.9 Operational Phase Mitigation

167. No likely significant effects have been identified. The following mitigation measure (W-SO3) would be implemented during detailed design and subsequent operation in order to reduce potential adverse effects.

5.3.9.1 Operation of New Culverts

168. In relation to culvert water body crossings, detailed design would ensure compliance with good practice. The mitigation measures are detailed in the SWMP (W-SO3).

5.3.10 Operational Phase Residual Effects

169. Following the implementation of the operational measure described in Section 5.3.9, all residual effects would be Not Significant (Table 5.12).

Table 5.12: Operational Phase Residual Effects on Water Bodies within the WTP Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
WBX004	Operation of new culvert	Hydromorphology	Increased bed and bank erosion, permanent removal of morphological features and changes to morphological process	Low	Medium adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SO3	Negligible	Not Significant

5.4 Break Pressure Tank

5.4.1 Design and Operation

170. As discussed in Section 2, the BPT has the highest elevation of the Proposed Project and is required to manage the water pressures generated in the operation of the Treated Water Pipeline from the WTP to the BPT. It is designed to ensure that both the Treated Water Pipelines remain full. The BPT is the point at which the pumped pressurised Treated Water Pipeline from the WTP to the BPT would connect to the primarily gravity-fed Treated Water Pipeline from the BPT to the TPR and therefore marks the end of the pressurised section and the commencement of the gravity-fed section. See A9.3 Figure 7 for the BPT study area.

171. The main substantial features associated with the BPT include:

- The BPT, consisting of three cells
- Control Building.

5.4.1.1 Location and Access

172. The site for the proposed BPT is approximately 6.8ha in area (excluding proposed access) and located in the townland of Knockanacree in County Tipperary, approximately 1.8km north of the town centre of Cloughjordan and 1.8km south of the Scohaboy (Sopwell) Bog SAC and 0.70km south of Scohaboy Bog NHA.

173. The site is currently predominantly agricultural land and used as pasture. Currently, the BPT site is accessed from the L1064 road via an unpaved farm track. It is proposed that a new access road would be constructed from the L1064, 5m in width and approximately 794m in length. There would ten car parking spaces provided at the BPT site.

5.4.1.2 Design

5.4.1.2.1 The Treatment Process

174. The Chlorine Control Building would house automatic chlorine monitoring and testing equipment and would also include a bunded sodium hypochlorite dosing system. These systems are required to maintain a minimum ‘chlorine residual’ in line with Uisce Éireann technical design standards.

5.4.1.2.2 Drainage

175. The BPT access road, and other paved areas, would be designed to incorporate SuDS principles as recommended by the SuDS Manual (C753) (CIRIA 2015), to limit discharges of rainwater runoff from the BPT site to the equivalent greenfield site flow rate. The roof of the BPT would be grassed to limit surface water runoff. Filter drains within the site boundary fence would collect surface water and direct it to an infiltration basin via small pumps in an underground chamber. The infiltration basin would be designed to hold a volume of 273m^3 to accommodate flows from a 1 in 100-year storm, with a 30% uplift for climate change. Reduced runoff rates have been considered in the design, due to the inclusion of a green roof on the BPT.

176. Over the edge drainage would be used on the access road. Foul wastewater generated on the site would be directed to a holding tank with a level sensor to alert when emptying is required, for disposal in a licensed manner via a licensed facility.

5.4.1.2.3 Operation and Maintenance

177. To facilitate cleaning, each cell of the reservoir would have a scour drain (located in a sump) leading to the infiltration basin. In any overflow events that occur, water would spill over into the central cell. The central cell can be drained through a dechlorination chamber prior to discharge to the infiltration basin.

5.4.2 Construction

178. Full details of the construction of the BPT are provided in Chapter 5 (Construction & Commissioning). Brief details of relevance to this assessment are also provided here for ease of reference.

179. The description of works in Section 5.2.1.2 and Table 2.1 of Section 2 (Project Components) is considered to be embedded mitigation for the purposes of this assessment.

5.4.2.1 Construction Main Elements

180. The main elements and sequence of construction activities are provided in Table 5.13, along with additional information relevant to this assessment.

Table 5.13: BPT Construction Main Elements

Sequence	Construction Activity	Further Details (of Relevance to Assessment)
1.	Site preparation works	• The access road would be formed initially as hardcore temporary access and become the basis for the permanent surface when civil/building works are complete • A satellite construction compound (CC3) area would be established.
2	Formation of temporary drainage, topsoil stripping and excavation of attenuation lagoon	• Temporary drainage measures constructed. Infiltration basin and filter drains to disperse surface water in a controlled manner • Infiltration basin which would be used for control of any surface water runoff. This infiltration basin would also be used for the control of sediment from the excavation.
3	Earthworks to reduce existing ground levels for the BPT substructure to formation level	• Construction of the proposed BPT would involve the excavation of the slope of the hill on which it is to be sited. The excavation of the hill slope would expose rock close to the surface. The rock face would only be exposed temporarily to allow the construction of the BPT structure before it is backfilled, and ground level reprofiled to integrate the proposed structure into the landscape. The exposed rock face would act as a stable face for construction along the western side of the BPT structure. As an additional precaution, it may also be sprayed with concrete or mortar (i.e. pneumatically projected at high velocity onto the surface of the rock face) to provide additional stability. In addition, a subsurface drain would be placed at the foot of the rock slope to catch any surface water or water seeping from rock joints, directing it to the attenuation lagoon on-site.
4	Construction of BPT and installation of below ground pipework	• A small concrete batching plant may need to be established at the BPT site if local concrete suppliers are unable to deliver concrete within the allowable time for deliveries.
5	Backfill around BPT to finished formation level	N/A
6	Installation of electricity supply	N/A
7	Construction of Control Building	N/A
8	Site works, landscaping and boundary treatment	N/A

5.4.3 Study Area and Baseline Conditions

181. The locations for all infrastructure components have been selected with the aim of reducing proximity to sensitive water bodies. In relation to the BPT, the infrastructure site is not within close proximity (within 50m) to any WFD designated water bodies (see Table 5.14).

182. There are no Other Waterbodies within the boundaries of the BPT site; there are potentially some field ditches and drains within close proximity to the proposed BPT which could provide pathways for pollution into the Ballyfinboy catchment. There are two tributaries of the Ballyfinboy River (Ballyfinboy_030 and Ballyfinboy_050), both of which are 1.5km away, one to the north and one to the south of the proposed site, and of Moderate WFD status.

Table 5.14: Summary of Baseline Conditions of Water Bodies within the BPT Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Potential field ditches, drains and surface water runoff pathways to Ballyfinboy_030	N/A	N/A	Other Waterbody, with <2km downstream pathway to Moderate status WFD designated water body. Water body is a drain with no morphological features or processes and likely to dry up in summer months. No known abstractions and no pathway downstream (within 5km) to a water body within a DWPA.	Medium	Negligible

5.4.4 Construction Phase Effects

5.4.4.1 Surface Water Quality and Hydrology

183. There would be no direct impacts on hydrology during construction. Potential indirect impacts could arise as a consequence of the dewatering of excavation sites, or the diversion or 'cut-off' of land drains and ditches. During dry weather, these activities could result in decreased water levels. Such impacts would be temporary over the Construction Phase and localised to the works footprint.

184. A negligible magnitude of impact is predicted, resulting in a Not Significant effect.

185. In the absence of control or mitigation measures, there is potential for spillage of oil, chemicals, concrete/cement and other pollutants to ground and the production of a large amount of silt-laden water as a result of dewatering or surface water runoff from stripped land.

186. However, there are no receptors on the site itself and the closest field drains and ditches are anticipated to be more than 50m from the site. As a result, a negligible magnitude of impact is predicted. This would result in a Not Significant effect.

5.4.4.2 Hydromorphology

187. There would be no direct impacts on the hydromorphology of any local field drains or ditches. Therefore, the magnitude of impact is assessed as negligible. This would result in an Imperceptible (not significant) effect.

5.4.4.3 Summary of Construction Phase Effects

188. Table 5.15 provides a summary of the Construction Phase effects for the BPT.

Table 5.15: Pre-Mitigation Summary of Construction Phase Effects on Water Bodies within the BPT Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Potential field ditches, drains and surface water runoff pathways to Ballyfinboy_030	Construction Compound and Site Preparation	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	Medium	Negligible	Not Significant
			Increases in silty runoff from construction works and discharge of construction drainage	Medium	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff	Negligible	Negligible	Imperceptible (not significant)

5.4.5 Construction Phase Mitigation and Residual Effects

189. Design embedded mitigation described in Section 4.2 would avoid significant impacts as a result of the construction of the BPT works. Therefore, no further mitigation measures would be required and there would be no residual effects. However, the SWMP (Annex A of Appendix A5.1: CEMP) identifies measures in relation to construction sequencing (W-SC30) and management of silt-laden water (W-SC31), while generic measures (see Section 4.3) would also apply.

5.4.6 Testing and Commissioning Phase Assessment of Effects

190. The BPT would be tested and commissioned together and alongside the HLPS at the WTP and the Treated Water Pipelines. Similar to the other Infrastructure Sites, this site would undergo water retention tests followed by water quality tests.

191. Any water which cannot be passed forward, or fails the water quality test, would be disposed of via the nearest washout valve on the Treated Water Pipeline from the BPT to TPR. Any discharged water would be treated as described for the Testing and Commissioning of the Pipeline.

192. Predicted impacts would be similar to those described for the Testing and Commissioning of the Pipeline. There would be no significant effects.

5.4.7 Operational Phase Assessment of Effects

5.4.7.1 Surface Water Quality and Hydrology

193. There would be no impacts on hydrology during the operation of the BPT.

194. There would be no process discharges from the BPT to the surface water environment during the Operational Phase and no wastewater discharges from welfare facilities. Foul wastewater generated on the BPT site would be passed through a holding tank with a level sensor which would alert when emptying is required. Overall, it is considered that there would be no impacts (resulting in a N/A magnitude) as a result of the BPT on surface water quality and hydrology receptors, leading to an Imperceptible (not significant) effect.

5.4.7.2 Hydromorphology

195. The BPT would be located within an area of agricultural land with no water body crossings. There are no proposed discharges or outfalls from the site. There are some field drains and ditches in the vicinity of the site and the change in the land use under the footprint of the BPT could lead to changes in overland flow pathways. However, it is considered that there would not be a significant impact on water bodies within the surrounding area. Overall, it is considered that there would be a negligible magnitude of impact as a result of the BPT on hydromorphology receptors, leading to a Not Significant effect.

5.4.7.3 Summary of Operational Phase Effects

196. Table 5.16 presents a summary of the effects on the water bodies in operation.

Table 5.16: Summary of Pre-Mitigation Operational Phase Effects on Water Bodies within the BPT Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Potential field ditches, drains and surface water runoff pathways to Ballyfinboy_030	Operation of BPT	Surface Water Quality and Hydrology	No impacts anticipated	Medium	N/A	N/A
		Hydromorphology	Potential for changes in flow pathways	Negligible	Negligible	Not Significant

5.4.8 Operational Phase Mitigation and Residual Effects

197. Following the implementation of design and operational measures as described in Section 5.4.1 of this appendix, no significant effects are identified. As a result, no additional mitigation is required.

5.5 Booster Pumping Station

5.5.1 Design and Operation

198. The BPS facilitates the movement of the water through the Treated Water Pipeline from the BPT to the TPR in high flows. Flows up to approximately 165Mld can move from the BPT to the TPR under gravity pressure without further intervention. However, when the demand for water increases above 165Mld, pipeline pressure losses increase to the point where there is insufficient pressure to deliver the water to the TPR by gravity. To provide the additional pressure required to deliver flows up to the peak demand of 300Mld, additional pumping is required. The BPS contains the pumps needed to do this. See A9.3 Figure 8 for the BPS study area.

5.5.1.1 Location and Access

199. The BPS site covers an approximate area of 2.6ha and is located on the L3003 (road), approximately 9km east of Birr and 8km south-west of Kilcormac.

200. Access to the BPS site would be directly off the L3003. There would be traffic circulation areas within the site including around the perimeter of the BPS. There would be four car parking spaces provided at the BPS site.

5.5.1.2 Design

201. The BPS Building is designed as a single storey building with a basement below. The building above ground level would include the following elements:
    - Welfare facilities
    - Office facilities
    - An overhead gantry crane is provided to remove pumps, motors and pipework
    - Internal vehicle loading bay.

202. The basement section of the BPS Building contains the Pump Hall which is open to the ground floor of the building with walkways running on either side. It would contain six pumps (four duty and two standby) and the incoming and outgoing pipeline. Surge suppression equipment would be located to the rear of the BPS Building.

5.5.1.2.1 Drainage

203. The BPS paved areas would be designed to incorporate SuDS principles to limit discharges from the site to the equivalent greenfield site flow rate. Surface water runoff would be conveyed via an underground drainage system to an attenuation pond, located at the front of the site. The volume of the attenuation basin would be 600m^3 to accommodate flows from a 1 in 100-year storm event and a 30% uplift in rainfall for climate change. Stormwater from the attenuation pond would be discharged via a 200mm underground pipe to the unnamed tributary of the Camcor River, approximately 200m east of the BPS site.

5.5.1.2.2 Power Supply

204. The power supply would be provided by Electricity Supply Board (ESB) Networks from its 38 kV network through a combination of overhead lines and buried cables terminating at a 38 kV Substation. The underground cable would be buried in the roads and use existing bridges for the crossings of the WFD designated Camcor_040 (WCX084) as well as the crossings WBX110, WBX111 and WBX112. There would also be a requirement to cross the WFD designated Camcor_050 (WCX078) which would be undertaken using a trenchless Horizontal Directional Drilling technique. Therefore, it is not likely that these crossings for the power supply would impact on these water bodies. The crossings WCX078, WCX084, WBX110, WBX111 and WBX112 are thus not considered further in this assessment.

5.5.1.3 Operation and Maintenance

205. Surface water runoff from impermeable areas would be conveyed via an underground drainage system to a stormwater attenuation basin located to the front of the BPS site. The volume of the attenuation basin has been designed to accommodate flows from a 1 in 100-year storm event plus a 30% uplift in rainfall for climate change. This volume has been calculated as 600m^3.

206. Surface water runoff entering the attenuation basin would be pre-treated in a Class 2 By-Pass Hydrocarbon Interceptor. This allows for any build-up of pollutants on the internal roadway or hard standing working areas that would be washed off in the early part of a storm to be treated. The outfall from the attenuation basin would be fitted with a penstock which can be used to isolate the attenuation basin and so contain pollutants in the event of an accidental spillage. Stormwater from the attenuation basin would be discharged at greenfield runoff rates via a 200mm diameter underground pipe to the Camcor_030 WFD designated water body, approximately 200m east of the BPS site.

5.5.2 Construction

207. Full details of the construction of the BPS are provided in Chapter 5 (Construction & Commissioning). Brief details of relevance to this assessment are also provided here for ease of reference.

208. The description of works in Section 5.2.1.2 and Table 2.1 of Section 2 (Project Components) is considered to be embedded mitigation for the purposes of this assessment.

5.5.2.1 Construction Main Elements

209. The main elements and sequence of construction activities are provided in Table 5.17 along with additional information relevant to this assessment.

Table 5.17: BPS Construction Main Elements

Sequence	Construction Activity	Further Details (of Relevance to Assessment)
1.	Site preparation works	• The access road would be formed initially as hardcore temporary access and become the basis for the permanent surface when civil/building works are complete • A Satellite Construction Compound (CC4) area would be established.
2	Topsoil stripping	• Topsoil would be stripped across the required site area to its full depth • Topsoil and top layer of subsoil stockpiles would be located away from drains and water bodies • Location of stockpiles would follow the guidelines outlined in the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016).
3	Earthworks, excavation and fill of the land to suitable levels for construction of structures on-site. Excavation for BPS substructure.	• The access road would be formed initially as hardcore temporary access and become the basis for the permanent surface when civil/building works are complete • Construction of the proposed BPS would involve construction of temporary drainage measures. Attenuation pond and filter drains would disperse surface water in a controlled manner. Infiltration basin would be used for control of any surface water runoff. This infiltration basin would also be used for the control of sediment from the excavation.
4	Construction BPS substructure and installation of below ground pipework	• A small concrete batching plant may need to be established at the BPS site if local concrete suppliers are unable to deliver concrete within allowable time for deliveries (typically 90 to 120 minutes depending on concrete mix, design and temperature).
5	Construction of BPS superstructure	
6	Construction of substation including MV Room and installation of electricity supply	
7	Site works, landscaping and boundary treatment	

5.5.3 Study Area and Baseline Conditions

210. The locations for all infrastructure components have been selected with the aim of reducing proximity to sensitive water bodies as far as possible. In relation to the BPS, it would be sited approximately 13m from the Camcor_030 at its closest point (see Table 5.18). This water body flows from the northern to eastern boundaries of the BPS site; however, the BPS is positioned so that it is as far from the water body as it can be and still serve its purpose with respect to the pipeline.

Table 5.18: Summary of Baseline Conditions of Water Bodies within the BPS Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Camcor_030	Good	Not at Risk	The Camcor_030 is a WFD designated water body of Good status. Little evidence of significant pressures. Potentially historically straightened to follow field boundaries. Low sinuosity with evidence of some morphological response. No known abstractions and no pathways downstream (within 5km) to a water body within a DWPA.	High	Medium

5.5.4 Construction Phase Effects

5.5.4.1 Camcor_030

5.5.4.1.1 Surface Water Quality and Hydrology

211. There would be one direct discharge of treated construction drainages to the Camcor_030 via attenuation basins. Discharges would be restricted to greenfield runoff rates; therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

212. In the absence of control or mitigation measures, there is potential for spillage of oil and chemicals within the Construction Compound and from mobile plant and machinery. There is also the potential for silty runoff water to be produced as a result of excavation to construct the BPS, dewatering of such excavations, and surface water runoff from stripped and stockpiled land. From the concrete batching plant on-site, there may be a release of cement/concrete which is highly alkaline. Additionally, discharge from the proposed outfall location could also provide a source of silty water. Further impacts may be caused by working on the channel banks to construct the outfall.

213. Working on the banks of and adjacent to the Camcor_030 and in the absence of control measures or mitigation, there is a reasonable likelihood of a pollution pathway being established. This would be temporary during the Construction Phase, and would be attenuated and treated via SuDS. As a result, a low adverse magnitude of impact is assessed. This would result in a Moderate (significant) effect.

5.5.4.1.2 Hydromorphology

214. Natural bank material would need to be removed to facilitate the outfall construction on the banks of the Camcor_030. Additionally, there is potential for indirect impacts as a result of increased sedimentation through the activities outlined above for surface water quality. These would be short-term impacts over the Construction Phase and localised to the discharge point and immediately downstream. Additionally, discharges of construction drainage would be treated through settlement in the attenuation pond prior to discharge. As a result, a low adverse magnitude of impact is assessed, resulting in a Slight (not significant) effect.

5.5.4.2 Summary of Construction Phase Effects

215. Table 5.19 provides a summary of the potential Construction Phase effects.

Table 5.19: Pre-Mitigation Summary of Construction Phase Effects on Water Bodies within the BPS Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Camcor_030	Construction of the BPS including discharge of construction drainage	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	High	Negligible	Not Significant
			Increases in silty runoff from construction works and discharge of construction drainage	High	Low adverse	Moderate (significant)
		Hydromorphology	Increases in silty runoff	Medium	Low adverse	Slight (not significant)

5.5.5 Construction Phase Mitigation

216. Generic mitigation measures for use across the Proposed Project are outlined in Section 4.3.

217. The close proximity of the Camcor_30 WFD designated water body to the Proposed Project at this location raises additional risks of potential pollution pathways for oil and silty water. As a result, the following additional, site-specific mitigation measures are required for the BPS. These are included in the SWMP (Annex A of Appendix A5.1: CEMP) and comprise measures relating to:

- Construction sequencing (W-SC32)
- Management of silt-laden water (W-SC33).

5.5.6 Construction Phase Residual Effects

218. Following implementation of mitigation and control measures, likely significant effects identified in Section 5.5.4 would be reduced to Not Significant. Table 5.20 provides a summary of the residual effects as a result of construction of the BPS.

Table 5.20: Summary of Residual Effects as a Result of Construction of within the BPS Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
Camcor_030	Construction of the BPS including discharge of construction drainage	Surface Water Quality and Hydrology	Increases in silty runoff from construction works and discharge of construction drainage	High	Low adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC32 & W-SC33	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff	Medium	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC32 & W-SC33	Negligible	Not Significant

5.5.7 Testing and Commissioning Phase Assessment of Effects

219. The BPS would need to pass the Factory Acceptance Test (FAT) and once installed, Site Acceptance Testing (SAT). These would be undertaken in the “dry” and would include all comms links to other infrastructure sites.

220. Full “wet” commissioning of the BPS can only take place once the pipeline from the BPT to the TPR is operational and water available from the WTP. A pre-requisite of this would be the full commissioning of the RWI&PS, WTP, pipelines, BPT, FCV and TPR.

221. Following disinfection of pipework, the next step would be commissioning the surge protection system. The BPS pumps would then be commissioned individually. Finally, acceptance testing would include an endurance test whereby the pumps are required to successfully run for an extended period.

222. Predicted impacts would be similar to those described for the Commissioning of the pipeline. There would be no significant effects.

5.5.8 Operational Phase Assessment of Effects

5.5.8.1 Camcor_030

5.5.8.1.1 Surface Water Quality and Hydrology

223. There would be no impacts on hydrology during the operation of the BPS. Operational discharge from the BPS site would be restricted to greenfield runoff rates. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

224. There would be no process discharges from the BPS to the surface water environment during the Operational Phase and no wastewater discharges from welfare facilities. Foul wastewater generated on the BPS site would be passed through a holding tank with a level sensor which would alert when emptying is required and would be tankered to an appropriately licensed waste facility. Surface water runoff would be treated via SuDS to acceptable levels prior to discharge via the new outfall. Therefore, the magnitude of impact is assessed as negligible, resulting in a significance of effect of Not Significant.

5.5.8.1.2 Hydromorphology

225. Operational surface water discharges would occur to the Camcor_030 WFD designated water body via the proposed outfall from the BPS. Discharges have the potential to alter flow regimes within the receiving water body local to and downstream of the outfall location. New discharges from the BPS site could result in increases in bed and bank erosion and changes to flow pathways and morphological features if they significantly alter the existing flow regime.

226. Outfall discharges would be restricted to greenfield runoff rates. Therefore, the magnitude of impact is assessed as low adverse, resulting in a Slight (not significant) effect.

5.5.8.2 Summary of Operational Phase Effects

227. Table 5.21 presents a summary of the Operational Phase effects for the identified water bodies.

Table 5.21: Summary of Pre-Mitigation Operational Phase Effects on Water Bodies within the BPS Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Camcor_030	Operation of the BPS	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	High	Negligible	Not Significant
			Discharge of operational drainage from BPS	High	Negligible	Not Significant
		Hydromorphology	Alteration of flow patterns as result of discharge of operational drainage from BPS	Medium	Low adverse	Slight (not significant)

5.5.9 Operational Phase Mitigation and Residual Effects

228. Following the implementation of design and operational measures and mitigation for the outfall applied (detailed in the SWMP (W-SO1)), no significant effects are identified. As a result, no additional mitigation is required (see Table 5.22).

Table 5.22: Operational Phase Residual Effects on Water Bodies within the BPS Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
Camcor_030	Operation of the BPS	Hydromorphology	Alteration of flow patterns as result of discharge of operational drainage from BPS	Medium	Low adverse	Slight (not significant)	W-SO1	Negligible	Not Significant

5.6 Flow Control Valve

5.6.1 Design and Operation

229. The FCV is a valve that will be used to control flows within the pipeline and manage the volume of water arriving at the TPR.

230. Full details of the FCV are provided in Chapter 4 (Proposed Project Description) and a brief description is also provided in Table 2.1 of Section 2 (Project Components). See A9.3 Figure 9 for the FCV study area.

5.6.1.1 Location and Access

231. The FCV would be approximately 5km west of the TPR, south of Newtown in County Kildare.

232. Access to the FCV site would be directly off the L1016 Commons Road Upper. There would be paved traffic circulation areas to all the elements of the FCV site. A Lay-By adjacent to the public road would allow for safe parking during access and egress. There would be four car parking spaces provided.

5.6.1.2 Design

5.6.1.2.1 Drainage

233. Drainage from the FCV site paved areas has been designed to incorporate SuDS principles to limit discharges from the site to the equivalent greenfield site flow rate. This would include filter drains to act as attenuation/infiltration devices and would disperse surface and stormwater in a controlled manner to the attenuation pond located to the north-west of the site.

234. An oil/petrol interceptor would be located upstream of the infiltration basin to provide protection against spillages.

5.6.1.2.2 Power Connection

235. The power supply to the FCV site would be provided by connection to an existing electricity supply via a combination of overhead lines and buried cables. Ground mounted solar panels are proposed on the northern side of the FCV.

5.6.1.3 Operation and Maintenance

236. The FCV would operate 24 hours a day to control water flows through the pipeline using an automated system that would be operated remotely. The site would be unmanned and visited infrequently for routine inspection and maintenance.

5.6.2 Construction

237. A stone hardcore base would be laid with an excavator and compacted. The base and walls of the FCV complex would be constructed in reinforced concrete, with concrete being applied in situ through a concrete pump and boom. The chamber would be capped with a precast lid, and openings would be provided in the top of this lid for securing with metal covers. All other materials would be manoeuvred into position, or placed, with cranes and excavators.

5.6.3 Study Area and Baseline Conditions

5.6.3.1 Study Area

238. The study area for the FCV has been defined as follows:

- Water bodies on the proposed site of the FCV (temporary and parking)
- Any water body within 50m of the site boundary of the FCV.

5.6.3.2 Baseline Conditions

239. The locations for all infrastructure components have been selected with the aim of reducing proximity to sensitive water bodies. In relation to the FCV, the infrastructure site is not within close proximity (within 50m) to any WFD designated water bodies.

240. There are no Other Waterbodies within the boundaries of the FCV site; there are potentially some field ditches and drains within close proximity which could provide pathways for pollution into the Liffey catchment (see Table 5.23). There is one tributary of the Liffey_140 (Reeves_010), which is 700m away to the west, and is of Good WFD status.

Table 5.23: Summary of Baseline Conditions of Water Bodies within the FCV Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Potential field ditches, drains and surface water runoff pathways to Liffey_140	N/A	N/A	Other Waterbody, with <2km downstream pathway to Good status WFD designated water body. Water body is a drain with no morphological features or processes and likely to dry up in summer months. No known abstractions. Pathway downstream (>2 and <5km) to a water body within a DWPA (Liffey_150).	High	Negligible

5.6.4 Construction Phase Effects

5.6.4.1 Surface Water Quality and Hydrology

241. There would be no direct impacts on hydrology during construction. Potential indirect impacts could arise as a consequence of the dewatering of excavation sites, or the diversion or ‘cut-off’ of land drains and ditches. During dry weather, these activities could result in decreased water levels. Such impacts would be temporary over the Construction Phase and localised to the works footprint.

242. A negligible magnitude of impact is predicted, resulting in a Not Significant effect.

243. In the absence of control or mitigation measures, there is potential for spillage of oil and chemicals to ground and the production of a large amount of silt-laden water as a result of dewatering or surface water runoff from stripped land. There is also the potential for the accidental release of potentially polluting cement/concrete from any in situ concrete works required. Concrete and cement are highly alkaline.

244. While there are no receptors on the site itself, the closest field drains and ditches are located within 50m of the proposed FCV site. A negligible magnitude of impact is predicted. This would result in a Not Significant effect.

5.6.4.2 Hydromorphology

245. There would be no direct impacts on the hydromorphology of any local field drains or ditches. Therefore, the magnitude of impact is assessed as negligible. This would result in an Imperceptible (not significant) effect.

5.6.4.3 Summary of Construction Phase Effects

246. Table 5.24 provides a summary of the Construction Phase effects for the FCV.

Table 5.24: Pre-Mitigation Summary of Construction Phase Effects on Water Bodies within the FCV Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Potential field ditches, drains and surface water runoff pathways to Liffey_140	Construction of the FCV including discharge of construction drainage	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	High	Negligible	Not Significant
			Increases in silty runoff from construction works and discharge of construction drainage	High	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff	Negligible	Negligible	Imperceptible (not significant)

5.6.5 Construction Phase Mitigation and Residual Effects

247. Design embedded mitigation described in Section 4.2 would avoid significant impacts as a result of the construction of the FCV works. Therefore, no further mitigation measures would be required and there would be no residual effects. However, the SWMP (Annex A of Appendix A5.1: CEMP) identifies measures in relation to construction sequencing (W-SC34) and management of silt-laden water (W-SC35), while generic measures (see Section 4.3) would also apply.

5.6.6 Testing and Commissioning Phase Assessment of Effects

248. Commissioning would take place in conjunction with the WTP, HLPS, Treated Water Pipelines, BPT, and TPR.

249. Predicted impacts would be similar to those described for the Testing and Commissioning of the Pipeline. There would be no significant effects.

5.6.7 Operational Phase Assessment of Effects

5.6.7.1 Surface Water Quality and Hydrology

250. There would be no impacts on hydrology during the operation of the FCV. There would be no process discharges from the FCV to the surface water environment during the Operational Phase. Overall, there would be no impacts (resulting in a N/A magnitude) as a result of the FCV on surface water quality and hydrology receptors, leading to an Imperceptible (not significant) effect.

5.6.7.2 Hydromorphology

251. The FCV would be located within an area of agricultural land with no water body crossings. There are no proposed discharges or outfalls from the site. There are some field drains and ditches in the vicinity of the site and the change in the land use under the footprint of the FCV could lead to minor changes in overland flow pathways. However, it is considered that there would not be a significant impact on water bodies within the surrounding area. Overall, it is considered that there would be a negligible magnitude of impact as a result of the FCV on hydromorphology receptors, leading to an Imperceptible (not significant) effect.

5.6.7.3 Summary of Operational Phase Effects

252. Table 5.25 presents a summary of the likely significant effects on the water bodies in operation.

Table 5.25: Summary of Pre-Mitigation Operational Phase Effects on Water Bodies within the FCV Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Potential field ditches, drains and surface water runoff pathways to Liffey_140	Operation of FCV	Surface Water Quality and Hydrology	No impacts anticipated	High	N/A	N/A
		Hydromorphology	Potential for changes in flow pathways	Negligible	Negligible	Imperceptible (Not Significant)

5.6.8 Operational Phase Mitigation and Residual Effects

253. Following the implementation of design and operational measures, no significant effects are identified. As a result, no additional mitigation is required.

5.7 Termination Point Reservoir

5.7.1 Design and Operation

254. The purpose of the TPR is to provide the link between the Treated Water Pipeline from the BPT to the TPR and the local distribution network in the Greater Dublin Area Water Resource Zone. The TPR would have a capacity of 75Ml to store treated water supplied through the Treated Water Pipeline from the BPT so that it is ready to be used by consumers. See A9.3 Figure 10 for the TPR study area.

255. The infrastructural elements associated with the TPR include:

- TPR
- Scour Water and Overflow Water Pumping Station
- Emergency Overflow Storage Tank (underground)
- Control Building.

5.7.1.1 Location and Access

256. The proposed TPR would be located adjacent to the existing service reservoir site at Peamount in County Dublin. The TPR would occupy the northern portion of the site measuring approximately 8.3ha. The site is currently agricultural. The whole of the site is required permanently except for a small amount of land needed temporarily during construction for a power cable diversion on the perimeter of the site.

257. The site is currently accessed via the access to the existing service reservoir, and an unpaved farm track suitable for off road vehicles only. The current access to the existing service reservoir is off the R120 via a public road on the north-eastern perimeter of Peamount Hospital. This access is relatively narrow and only receives small volumes of traffic to the various domestic properties along its route; there is no through traffic as it is a cul-de-sac. This unpaved farm track follows the north-eastern and northern perimeter of the existing service reservoir boundary.

258. A new access road, 5m in width and approximately 342m in length, is proposed to be constructed off the R120 regional road, and adjacent to the western and northern perimeter of Peamount Hospital. The new road is required due to the number of domestic properties along the existing access road which render it unsuitable for construction traffic. Car parking would be available at the existing Uisce Éireann reservoir.

5.7.1.2 Design, Operation and Maintenance

259. The TPR would be primarily a storage facility and provide the link between the Proposed Project and the local distribution network in the Greater Dublin Area Water Resource Zone.

260. The option of how to move the water to and from Peamount would be an operational one depending on operational requirements at any given time.

261. An Emergency Overflow Storage Tank would be provided on the site as a buffer for scour or overflow from the TPR cells. The control systems in place at the TPR would continuously monitor the water levels in the TPR and respond to any changes in the normal operating regime. This would limit the possibility of a spill from the emergency overflow from the TPR to the Emergency Overflow Storage Tank. Should an emergency overflow event occur, the retained volume in the Emergency Overflow Storage Tank would be tankered directly off site from the Emergency Overflow Storage Tank for disposal in a licensed manner via a licensed facility.

5.7.1.3 Drainage

262. The TPR access road, and other paved areas, would be designed to incorporate SuDS principles to limit discharges from the TPR site to the equivalent greenfield site flow rate. This would include provision of filter drains to accept surface water runoff from the proposed access road and paved areas. The filter drains would disperse surface and stormwater in a controlled manner to the attenuation ponds located to the south-west of the site and along the site access road. One of these would be on the northern side of the site and have a capacity of 1,229m^3. The second attenuation pond would be located to the southern end of the site beside the entrance and have a capacity of 1,329m^3. Both of these ponds have been sized to accommodate flows from a 1 in 100-year storm event with a 30% climate change uplift.

263. Surface water runoff entering the attenuation ponds would be pre-treated in a Class 2 By-Pass Hydrocarbon Interceptor. This allows for any build-up of pollutants on the internal roadway or hard standing working areas that would be washed off in the early part of a storm to be treated. The outfall from the attenuation ponds would be fitted with a penstock which can be used to isolate the attenuation ponds and so contain pollutants in the event of an accidental spillage.

264. Stormwater from the attenuation basins would be discharged at greenfield runoff rates via 200mm diameter underground pipework to the Liffey_170 to the north and north-west of the site.

265. Foul wastewater from the Control Building would connect to the existing sewer on-site (which would be diverted as part of the construction works).

5.7.2 Construction

266. Full details of the construction of the TPR are provided in Chapter 5 (Construction & Commissioning). Brief details, of relevance to this assessment, are also provided here for ease of reference. The description of works in Section 5.2.1.2 and Table 2.1 of Section 2 (Project Components) is considered to be embedded mitigation for the purposes of this assessment.

5.7.2.1 Construction Main Elements

267. The main elements and sequence of construction activities are provided in Table 5.26 along with additional information relevant to this assessment.

Table 5.26: TPR Construction Main Elements

Sequence	Construction Activity	Further Details of Relevance to the Assessment
1.	Site preparation works	• The access road would be formed initially as hardcore temporary access and become the basis for the permanent surface when civil/building works are complete • A Satellite Construction Compound (CC7) area would be established.
2	Topsoil stripping	• Stripped for laydown areas and covered with geotextile membrane and layer of stone • The appointed Contractor would construct temporary drainage measures to minimise the risk of pollution during earthworks construction and other elements of work. This would include the construction of filter drains and attenuation ponds to disperse surface water in a controlled manner and limit it to greenfield runoff rates • Fuel storage areas paved with bunding and hydrocarbon interceptors.
3	Excavation for Emergency Overflow Storage Tank, and earthworks to formation of TPR	• Dewatering may be required during excavations and construction.
4	Construction of Emergency Overflow Storage Tank and installation of pipework	
5	Construction of TPR and installation of pipework.	• The TPR would be constructed using reinforced concrete, with three baffled and discrete cells for the Proposed Project. Given that bedrock is at a shallow depth, the overburden would be removed, and the structure would be founded on mass reinforced concrete over its footprint. In addition, there would be a below ground Emergency Overflow Storage Tank. The latter would be utilised for emergency storage and capacity during maintenance and inspection, or in the event of an overflow occurring. The construction of this tank would require excavation in rock.
6	Construction of Chlorine Control Building	• The Chlorine Control Building would be a single storey flat roof building to tie in with the reservoir. It would be founded on concrete strip footing requiring removal of the overburden to the shallow rock underneath.
7	Connection to electricity supply and connections to existing pipework	N/A
8	Site works, landscaping and boundary treatment	N/A

5.7.3 Study Area and Baseline Conditions

5.7.3.1 Study Area

268. The study area for the TPR has been defined as follows:

- Water bodies on the proposed site of the TPR and the new access road
- Any water body within 50m of the site boundary of the TPR
- The Liffey Basin.

269. The water abstracted from the Derg HMWB would be treated at the WTP to the same standard as water from the Liffey catchment. As a result, there would be no 'raw water' transferred from the Shannon catchment to the Liffey catchment. Further details of this are provided in Appendix A9.1 (Abstraction Assessment).

270. In addition, the volume of water passing through the water supply and drainage system 'downstream' of the TPR would not change, simply the primary source of that water. It is considered, therefore, that the study area ends at the TPR.

5.7.3.2 Baseline Conditions

271. Locations for all infrastructure components have been selected with the aim of reducing proximity to sensitive water bodies. In relation to the TPR, the infrastructure site would not contain, nor be in close proximity (within 50m) to, any water bodies of a medium or higher sensitivity (see Table 5.27). Therefore, construction impacts would be unlikely.

272. There is the potential for unmapped field drains and ditches within the study area and adjacent to the site which could provide a pathway for pollution into the River Liffey catchment. A field drain runs along the perimeter of the site and is drained by a number of ditches to the north of the site feeding into a tributary of the River Liffey (Liffey_170) approximately 600m from the site boundary.

Table 5.27: Summary of Baseline Conditions of Water Bodies within the TPR Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Liffey_170	Poor	At Risk	The Liffey_170 is a WFD designated water body of Poor status and downstream pathway (<2km) to the Grand Canal Main Line (Liffey and Dublin Bay) NHA. This reach of the Liffey_170 is of low sinuosity with limited evidence of morphological features. Existing significant pressures include multiple water bodies crossed by existing infrastructure and historic realignment to follow field boundaries and existing infrastructure. No known abstractions and no pathway downstream (within 5km) to a water body within a DWPA.	High	Medium
Unnamed field drains and ditches with potential pathway to the Liffey_170	N/A	N/A	Other Waterbody, with <2km downstream pathway to Liffey_170 (Poor status). Water bodies form drains with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions and no pathway downstream (within 5km) to a water body within a DWPA.	Medium	Negligible

5.7.4 Construction Phase Effects

5.7.4.1 Liffey_170

5.7.4.1.1 Surface Water Quality and Hydrology

273. There would be no direct impacts on hydrology during construction. Potential indirect impacts could arise as a consequence of the dewatering of excavation sites, or the diversion or 'cut-off' of land drains and ditches. During dry weather, these activities could result in a drawdown of groundwater levels, reducing recharge to local rivers and streams, leading to a 'drought effect'.

274. The TPR would be located within an area of agricultural land with no water bodies within 50m of the site or access road. The change in the land use under the footprint of the TPR could lead to changes in overland flow pathways through some field ditches and drains connecting to the Liffey_170 which is almost 600m from the site boundary. However, these impacts would be temporary over the Construction Phase and localised to the working footprint. The Liffey_170 is a large catchment, the majority of which would still drain as it does under baseline conditions. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

275. In the absence of control or mitigation measures, there would be potential for spillage of oil and chemicals to ground and production of some silt-laden water as a result of dewatering or surface water runoff from stripped land. There is also the potential for the release of potentially polluting cement/concrete from any in situ concrete construction required. Concrete and cement are highly alkaline. There are no WFD designated water bodies within 50m of the site, but numerous ditches and drains which flow into the Liffey_170, which is nearly 600m from the site boundary, could potentially be affected.

276. Given the distance from the site and the potential for suspended solids to settle out, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

5.7.4.1.2 Hydromorphology

277. The TPR would be located within an area of agricultural land with no water bodies identified within the proposed construction footprint or access road. The change in the land use under the footprint of the TPR could lead to changes in overland flow pathways through some field ditches and drains connecting to the Liffey_170 located almost 600m from the site boundary. However, it is considered that these impacts would be of negligible magnitude, resulting in a Not Significant effect.

5.7.4.2 Unnamed Field Drains and Ditches

5.7.4.2.1 Surface Water Quality and Hydrology

278. There would be some limited direct impacts on hydrology at the TPR site during construction as a result of the interruption to surface water runoff pathways over the footprint of the works. Potential indirect impacts could also arise as a consequence of the dewatering of excavation sites, or the diversion or 'cut-off' of land drains and ditches. These impacts would be at a local scale and temporary over the Construction Phase. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

279. In the absence of control or mitigation measures, there is potential for spillage of oil and chemicals to ground at the Construction Compound and from mobile plant and machinery. There is also the potential for the release of potentially polluting cement/concrete from any in situ concrete construction required. Concrete and cement are highly alkaline. There may also be the production of silt-laden water as a result of dewatering or surface water runoff from stripped land.

280. The water body is located downstream, directly adjacent to the north-western corner of construction activities. In the absence of control measures or mitigation, there is a reasonably high likelihood of a pollution pathway being established to it. As a result, an impact of medium adverse magnitude is predicted. This would result in a Moderate (significant) effect.

5.7.4.2.2 Hydromorphology

281. There is potential for increased sediment in local field drains and ditches as a result of construction works. Given that under baseline conditions these water bodies have no morphological features and processes, the magnitude of impact is assessed as low adverse. This results in a Not Significant effect.

5.7.4.3 Summary of Construction Phase Effects

282. A summary of the potential construction effects is provided in Table 5.28.

Table 5.28: Pre-Mitigation Summary of Construction Phase Effects on Water Bodies within the TPR Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Liffey_170	Construction of the TPR including discharge of construction drainage	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	High	Negligible	Not Significant
			Increases in silty runoff from construction works and discharge of construction drainage	High	Negligible	Not Significant
		Hydromorphology	Increases in silty runoff	Medium	Negligible	Not Significant
Unnamed field drains and ditches with potential pathway to the Liffey_170	Construction of the TPR including discharge of construction drainage	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	Medium	Negligible	Not Significant
			Increases in silty runoff	Medium	Medium adverse	Moderate (significant)
		Hydromorphology	Increases in silty runoff	Negligible	Low adverse	Not Significant

5.7.5 Construction Phase Mitigation

283. No site-specific mitigation measures are required for the TPR site. However, the SWMP (Annex A of Appendix A5.1: CEMP) identifies measures in relation to construction sequencing (W-SC36) and management of silt-laden water (W-SC37), while generic measures (see Section 4.3) would also apply.

284. Generic mitigation measures for use across the Proposed Project are outlined in Section 4.3.

5.7.6 Construction Phase Residual Effects

285. Following implementation of mitigation and control measures, the likely significant effects identified in Section 5.7.4 would be reduced to Not Significant. Table 5.29 provides a summary of the residual effects on water bodies within the TPR study area.

Table 5.29: Summary of Residual Effects as a Result of Construction within the TPR Study Area

Water Body Name/ID	Activity	Attribute	Potential Impact	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)	Mitigation ID	Residual Magnitude	Residual Significance of Effect
Unnamed field drains and ditches with potential pathway to the Liffey_170	Construction of the TPR including discharge of construction drainage	Surface Water Quality and Hydrology	Increases in silty runoff	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC36 & W-SC37	Negligible	Not Significant

5.7.7 Testing and Commissioning Phase Assessment of Effects

286. The TPR would be tested and commissioned together and alongside the HLPS at the WTP and the Treated Water Pipelines. Similar to the other Infrastructure Sites, this site would undergo water retention tests followed by water quality tests.

287. Any water which cannot be passed forward, or fails the water quality test, would be disposed of via the nearest washout valve on the Treated Water Pipeline from the BPT to the TPR. Any discharged water would be treated as described for the Testing and Commissioning of the Pipeline.

288. Predicted impacts would be similar to those described for the Testing and Commissioning of the Pipeline. There would be no significant effects.

5.7.8 Operational Phase Assessment of Effects

5.7.8.1 Liffey_170

5.7.8.1.1 Surface Water Quality and Hydrology

289. There would be no impacts on hydrology during the operation of the TPR. Operational discharge from the TPR site would be restricted to greenfield runoff rates. Therefore, the magnitude of impact is assessed as negligible, resulting in a significance of effect of Not Significant.

290. There would be no process discharges from the TPR to the surface water environment during operation. Surface water discharges to filter drains would be as described previously and in Chapter 4 (Proposed Project Description), for attenuation and discharged to the local drainage network which has a pathway downstream to the Liffey_170 approximately 600m away. Additionally, the water would be treated and hydrocarbon interceptors would be installed. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

5.7.8.1.2 Hydromorphology

291. It is not anticipated that there would be any operational impacts on hydromorphology as a result of the TPR. Surface water runoff would be attenuated to greenfield runoff rates and discharged to drainage ditches 600m upstream of the Liffey_170. There are no proposed new outfalls from the TPR to the Liffey_170. Therefore, the magnitude of impact is assessed as negligible, resulting in a significance of effect of Not Significant.

5.7.8.2 Unnamed Field Drains and Ditches

5.7.8.2.1 Surface Water Quality and Hydrology

292. The operational drainage systems would attenuate and discharge treated runoff at greenfield runoff rates. Therefore, the magnitude of impact is assessed as negligible, resulting in a significance of effect of Not Significant.

293. There would be no process discharges from the TPR to the surface water environment during operation. Surface water runoff from areas of hard standing would be discharged to the unnamed ditch/drain. The attenuation basins would be fitted with hydrocarbon interceptors. Additionally, the water would be treated through the attenuation basins prior to discharge. Therefore, the magnitude of impact is assessed as negligible, resulting in a Not Significant effect.

5.7.8.2.2 Hydromorphology

294. There would be no requirement to realign or culvert the unnamed field drain/ditch and therefore no direct impacts to hydromorphology are anticipated. Outfall discharges would be limited to greenfield runoff rates. Therefore, the magnitude of impact is assessed as negligible, resulting in an Imperceptible (not significant) effect.

5.7.8.3 Summary of Operational Effects

295. A summary of the operational effects is provided in Table 5.30 below.

Table 5.30: Summary of Pre-Mitigation Operational Phase Effects on Water Bodies within the TPR Study Area

Water Body Name/ID	Activity	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Liffey_170	Operation of TPR	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	High	Negligible	Not Significant
			Discharge of operational drainage from TPR	High	Negligible	Not Significant
		Hydromorphology	Discharge of operational drainage from TPR	Medium	Negligible	Not Significant
Unnamed field drains and ditches with potential pathway to the Liffey_170	Operation of TPR and discharge of operational drainage	Surface Water Quality and Hydrology	Potential for impacts/changes to flow pathways and volumes	Medium	Negligible	Not Significant
			Discharge of operational drainage from TPR	Medium	Negligible	Not Significant
		Hydromorphology	Discharge of operational drainage from TPR	Negligible	Negligible	Imperceptible (not significant)

5.7.9 Operational Phase Mitigation and Residual Effects

296. Mitigation embedded in the design would mean there would be no significant effects as a result of the operation of the TPR. Therefore, no further mitigation measures would be required.

5.8 Proposed 38 kV Uprate Works – Power Supply to RWI&PS and WTP

5.8.1 Design and Operation

297. The Proposed 38 kV Uprate Works are necessary to deliver adequate electrical power to the RWI&PS and WTP to allow them to function as intended. The proposed works would include the uprating of the existing Ardnacrusha – Birdhill 38 kV overhead line. The works would also include the removal of polesets on the Ardnacrusha – Birdhill – Nenagh Line and replacement with a double-circuit underground cable and works at the Birdhill 38 kV Substation.

298. Full details of the Proposed 38 kV Uprate Works are provided in Chapter 4 (Proposed Project Description) and a brief description of works is provided in Table 2.1 of Section 2 (Project Components).

5.8.1.1 Permanent Access

299. The identification of access routes to all structures where works are to be undertaken is outlined in the construction methodology contained in Chapter 5 (Construction & Commissioning). A summary is provided in Section 5.8.2 below. No permanent access to the 38 kV infrastructure is required during operation of the Proposed Project.

5.8.2 Construction

300. The primary activities during construction with the potential to interact with water bodies are as follows:

- The establishment and operation of construction compounds throughout the Construction Phase
- Excavations to replace existing polesets, should they be in poor condition and require replacement
- Undergrounding of existing overhead lines, including creation of trenches for lines and removal of existing polesets
- The crossing of water bodies by construction vehicles via the existing road network or temporary bridges.

5.8.2.1 Construction Compounds

301. The existing Electricity Supply Board Networks (ESBN) Depot on Rosbrien Road in Limerick would be used to store construction materials prior to transfer to the required locations on an as-needed basis during the works. It is located to the south-west of Limerick City Centre and is approximately 6km south-west of the Ardnacrusha Generating Station. The depot would act as ESBN's operational hub for plant/material/labour movement and general storage required during the Proposed 38 kV Uprate Works.

302. In addition to the use of the existing ESBN Depot, the construction crew may set up temporary construction facilities at the locations of the specific worksites. These would typically include sanitary and welfare facilities but may, on occasion, include additional services as deemed necessary.

5.8.2.2 Access

303. The public road network would be used in the first instance to gain access to the general vicinity of the proposed works. Access to each individual structure, which would be typically located on private land and would utilise an access route, would be identified by the Project Team.

304. ESBN endeavours to use existing farm entrances and tracks and/or tracking across farmland where land conditions are suitable. The access location to each structure would be carefully selected to avoid adverse impacts on the surrounding environment, including surface water features.

305. The method of access, whether simply crossing existing fields or laying surface protection materials such as bog mats, is dependent on the nature of the works to be undertaken at each site, the local ground conditions and the ecological sensitivity of the area.

306. Access in any peat area or wetland would be achieved using wide-tracked, low ground pressure vehicles to minimise damage to the surrounding ground. In particularly sensitive or wet areas, bog mats would be installed to mitigate any possible damage to the 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 would be placed on the surface and stone placed on top and compacted to form the track. It is noted however that it is not anticipated that stone roads would be required for the Proposed 38 kV Uprate Works.

5.8.2.3 Temporary Construction Roads

307. Existing trackways would be used where available to access construction sites. Access to any peat area or wetland would be achieved by the methods described above.

308. Temporary clear span bridges would be used to provide access for construction machinery across water bodies where there is no existing crossing structure. Clear span bridges may include multiple layers of bog mats, wooden sleepers or lightweight metal structures. This crossing method would be used unless an alternative crossing method is agreed with IFI.

309. There is one overhead line being uprated between the Ardnacrusha Generating Station and the pumping station at Birdhill. This line crosses six WFD designated water bodies, including three crossings of the Blackwater (Clare)_020 and three crossings of the Shannon (Lower)_050. There are also 74 crossings of Other Waterbodies between Ardnacrusha Generating Station and the pumping station at Birdhill. These are all oversailing crossings. Details of these water bodies are provided in Section 5.8.3 (Study Area and Baseline Conditions).

310. There is no requirement to provide temporary crossing infrastructure for the Shannon (Lower)_050 or the Ardnacrusha Headrace, for which there are two crossings of each. Existing public road crossings of both these significant water bodies would be utilised throughout the works.

5.8.2.4 Undergrounding of Existing Overhead Lines

311. A section of the Ardnacrusha – Birdhill – Nenagh Line (east of the R494) running in a northerly direction to the Birdhill 38 kV Substation would be undergrounded. This undergrounding of the overhead line would cross four tributaries of the Kilmastulla_050.

5.8.3 Study Area and Baseline Conditions

312. Table 5.31 provides an overview of water bodies in relation to the Proposed 38 kV Uprate Works.

Table 5.31: Summary of Baseline Conditions of Water Bodies for the Proposed 38 kV Uprate Works Study Area

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
Blackwater (Clare)_020: PSNWCX001 to PSNWCX003	Good	At Risk	The Blackwater (Clare)_020 is a WFD designated water body of Good status. In this location, the water body displays a moderately sinuous planform. Mature riparian vegetation lines both banks making further characterisation difficult, but given the moderately sinuous planform it is assumed active fluvial processes are present. Existing pressures include culverting below road infrastructure and residential properties. Downstream of the proposed crossing location, the water body is culverted below the Other Waterbody associated with the upstream River Shannon, which feeds the Ardnacrusha Generating Station. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a water body within a DWPA, Shannon (Lower)_060.	High	Medium
Shannon (Lower)_050 (Main Stem): PSNWCX004	Poor	At Risk	The Shannon (Lower)_050 is a WFD designated water body of Poor status. The crossing location is within the Lower Shannon SAC. Main river with predominately glide flow and plane-bed features, with areas of island formation and localised bank erosion suggesting it is a morphologically active river. Anthropogenic pressures include bridges, and flow control for hydroelectric power upstream of the crossing location. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a water body within a DWPA, Shannon (Lower)_060.	Very high	Medium
Shannon (Lower)_050 (outside of SAC - tributaries): PSNWCX005 & PSNWCX006	Poor	At Risk	The Shannon (Lower)_050 is a WFD designated water body of Poor status. This reach of the Shannon (Lower)_050 forms a tributary to mainstem Shannon (Lower)_050. The tributary is not designated as part of the Lower Shannon SAC at the crossing location; however, it has a pathway to the SAC downstream (within 2km). Morphologically, the water body displays a straight planform with limited morphological features and process. No known abstractions, but the water body has a pathway downstream (>2km and <5km or >5km) to a water body within a DWPA, Shannon (Lower)_060.	High	Medium
Kilmastulla_050: WCX077	Moderate	At Risk	The Kimastula_050 is a WFD designated water body of Moderate status. Although the water body is not crossed by the Proposed 38 kV Uprate Works, there is potential for interaction with the Lower Shannon SAC. The water body forms a low to moderately sinuous planform with an abundance of morphological features including riffles, runs, glides, pools and bars. Active localised bank erosion alongside morphological features and processes suggests a morphologically active river. Anthropogenic pressures include culvert and bridge crossings via roads and field access tracks. No known abstractions and no pathway downstream (within 5km) to a water body within a DWPA.	Very high	High

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
PSNWBX001, PSNWBX002 &	Non-designated	N/A	Other Waterbodies, with <2km downstream pathway to a WFD designated water body of Moderate status or below and >2km and <5km downstream pathway to the Lower River Shannon SAC. These have straightened/modified planforms with limited fluvial processes. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a DWPA, Shannon (Lower)_060.	High	Low
PSNWBX003	Non-designated	N/A	Other water body, with >2km and <5km downstream pathway to Shannon (Lower)_060 WFD Drinking water protected - River. Heavily modified / straightened planform with limited fluvial processes. No known abstractions, Downstream pathway (>2km and <5km) to a Drinking Water Protected river, Shannon (Lower)_060.	Medium	Low
PSNWBX004	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. This has straightened/modified planforms with limited fluvial processes. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a water body within a DWPA, Shannon (Lower)_060.	High	Low
PSNWBX005	Non-designated	N/A	Other Waterbody, with >5km downstream pathway to North Ballycannan_010 (Moderate status) and protected area. Straightened/modified planform with limited fluvial processes. No known abstractions and no pathway to (within 25km) a DWPA.	Negligible	Low
PSNWBX006, PSNWBX007, PSNWBX008, PSNWBX009 & PSNWBX010	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to the Lower River Shannon SAC. The water body has a straightened/modified planform with limited fluvial processes. No known abstractions and no pathway downstream (within 25km) to a water body within a DWPA.	High	Low
PSNWBP001 to PSNWBP004 & PSNWBP023	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to a WFD designated water body and/or a >2km and <5km downstream pathway to a protected area. Straightened/modified planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a DWPA, Shannon (Lower)_060.	High	Negligible

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
PSNWBP005 to PSNWBP007, PSNWBP024 to PSNWBP027, PSNWBP051, PSNWBP052, PSNWBP060,	Non-designated	N/A	Other Waterbody, with <2km downstream pathway to a WFD designated water body and/or a >2km and <5km downstream pathway to a protected area. Straightened/modified planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a DWPA, Shannon (Lower)_060.	Medium	Negligible
PSNWBP049, PSNWBP050	Non-designated	N/A	Other Waterbody, with downstream pathway to Blackwater (Clare)_020 (Good status) and >2km and <5km downstream pathway to Lower River Shannon SAC. Heavily modified / straightened planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions and no pathways downstream (within 5km) to a river or lake in a Drinking Water Protected Area.	High	Negligible
PSNWBP008 to PSNWBP020, PSNWBP028 & PSNWBP029, PSNWBP031 to PSNWBP046	Non-designated	N/A	Other Waterbodies, with <2km downstream pathway to the Lower River Shannon SAC. Straightened/modified planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions and pathway downstream (>2km and <5km or >5km) to a DWPA.	High	Negligible
PSNWBP030	Non-designated	N/A	Other Waterbody; the crossing location is within the Lower Shannon SAC. Straightened/modified planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions, but the water body has a pathway downstream (>2km and <5km) to a DWPA, Shannon (Lower)_060.	Very high	Negligible
PSNWBP047, PSNWBP056 & PSNWBP057	Non-designated	N/A	Other Waterbodies, with <2km downstream hydrological connection to Shannon (Lower)_050 Nutrient Sensitive River. Highly straight / modified planform with no fluvial processes. Likely to dry up in summer months. No known abstractions with downstream pathway (within 5km) to a DWPA.	High	Negligible
PSNWBP048	Non-designated	N/A	Other Waterbody, with no downstream pathway to protected sites. Highly straight / modified planform with no fluvial processes. Likely to dry up in summer months. No known abstractions and with downstream pathway (<2km) to a DWPA, Shannon IRBD.	High	Negligible

Water Body Name/ID	WFD Designated Water Body Status (2019 - 2024)	WFD Risk Status	Sensitivity Reasoning	Sensitivity	
				Surface Water Quality and Hydrology	Hydromorphology
PSNWBP053 & PSNWBP054	Non-designated	N/A	Other Waterbodies, with <2km downstream hydrological connection to Shannon (Lower)_050 Nutrient Sensitive River. Highly straight / modified planform with no fluvial processes. Likely to dry up in summer months. No known abstractions and no downstream pathway (within 5km) to a DWPA.	High	Negligible
PSNWBP055	Non-designated	N/A	Other Waterbody, with no downstream pathway to protected sites. Highly straight / modified planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions and no pathways downstream (within 5km) to a Drinking Water Protected river or lake.	Medium	Negligible
PSNWBP058, PSNWBP059 & PSNWBP062	Non-designated	N/A	Other Waterbodies, with <2km downstream pathway to Derg HMWB Nutrient Sensitive Lake. Highly straight / modified planform with no fluvial processes. Likely to dry up in summer months. No known abstractions and no downstream pathway (within 5km) to a Drinking Water Protected river or lake.	High	Negligible
PSNWBP060, PSNWBP065 to PSNWBP070	Non-designated	N/A	Other Waterbodies, with no pathway to designated sites. Highly straight / modified planform with no fluvial processes. Likely to dry up in summer months. No known abstractions, hydrologically connected downstream (within 5km) to a Drinking Water Protected river, Shannon (Lower)_060.	High	Negligible
PSNWBP061 & PSNWBP063	Non-designated	N/A	Other Waterbodies, with no downstream pathway to designated sites. Highly straight / modified planform with no fluvial processes. Likely to dry up in summer months. No known abstractions, pathways downstream (within 5km) to a Drinking Water Protected river, Shannon (Lower)_050.	High	Negligible
PSNWBP064	Non-designated	N/A	Other Waterbody, with downstream pathway to Blackwater (Clare)_020 (Good status), <2km pathway downstream to Blackwater (Clare)_020 (Good status) and >2km and <5km downstream pathway to Lower River Shannon SAC. Heavily modified / straightened planform with no morphological features or fluvial processes and likely to dry up in summer months. No known abstractions and no pathways downstream (within 5km) to a river or lake in a Drinking Water Protected Area.	High	Negligible

5.8.4 Construction Phase Effects

313. The Proposed 38 kV Uprate Works would be undertaken on existing infrastructure. The works at Birdhill 38 kV Substation are not in close proximity to a water body and therefore have not been considered further. All construction compounds are to be located at existing ESBN site depots or compounds. As a result, this activity is scoped out of the assessment. For the polesets that need replacement, this would require excavations to install the poles in the ground. The average working area would extend 15m around the base of the poleset. Two trenches would be excavated to a depth of 2m–3m. The top layer would be excavated first and stockpiled adjacent to the construction area on bog mats or other suitable material. The lower subsoil would be stored separately. Each pole would be buried to a depth of about 2.3m in the ground with the excavation carried out using a tracked excavator and would be pushed into a vertical position. The excavation would be backfilled using a smaller tracked excavator.

314. There is potential for impacts from the Proposed 38 kV Uprate Works resulting directly from the crossing of water bodies by plant and machinery via temporary crossings. The temporary crossing locations are not known at this stage and would be subject to ESBN approval. However, for the purpose of this assessment it is assumed that temporary crossing locations would be located at the point in which the overhead line currently crosses the water body should no obvious existing road crossing be apparent from mapping.

315. The assessment considers the likely significant effects of the Proposed 38 kV Uprate Works prior to mitigation or control measures being implemented. A summary of likely significant effects due to construction is presented under the specific headings below. A detailed assessment of the magnitude and resultant significance of effect (pre-mitigation) of construction impacts on receptors is provided in Table 5.32. Note that no surface water abstractions with pathways downstream or water bodies within DWPAs have been identified within 2km of the Proposed 38 kV Uprate Works. Therefore, surface water supply has been scoped out of the impact assessment as no effects are anticipated.

5.8.4.1 Surface Water Quality and Hydrology

5.8.4.1.1 Construction Impact 1 – Changes in Surface Water Runoff/Drainage Pathways

316. The proposed construction activities may result in localised changes to surface water drainage patterns, flow pathways, subsequent flow volumes and restrictions to infiltration of rainfall in soils. While drainage networks are present, any disturbance to these would be localised and temporary in duration. Surface water contributions would remain unchanged and would likely discharge to the same catchment.

5.8.4.1.2 Construction Impact 2 – Release of Silty Water

317. Excavation works to install the polesets, alongside the storage of excavated material, vegetation clearance, temporary crossings of water bodies and infilling of trenches, could pose a risk to surface water quality through the potential for contaminated surface water runoff and the release of sediment to nearby water bodies. Working next to water bodies and along the bank top could also cause sediment-laden runoff due to heavy plant and machinery eroding the banks.

318. Elevated levels of sediment could impact on water quality by affecting dissolved oxygen, pH, turbidity, and nutrient levels, all of which have the potential to have negative impacts on aquatic species. The excavation of trenches for poleset placement may require dewatering (depending on ground conditions and water table elevations at the time of excavation), and any associated discharges from groundwater to water bodies could alter baseline water quality.

5.8.4.1.3 Construction Impact 3 – Increased Erosion of Exposed Surfaces

319. The use of construction vehicles and machinery can cause increased erosion of exposed surfaces, which once exposed to rainfall, can result in excessive volumes of eroded material entering surface water features. Excessive sediment-laden runoff may potentially have a negative impact on water quality. Proposed access tracks used to facilitate construction may affect surface runoff patterns creating alternative flow paths and may promote erosion of previously unaffected areas.

5.8.4.1.4 Construction Impact 4 – Accidental Release of Polluting Materials

320. An accidental release of potentially polluting substances, such as cement, oils, fuels and lubricants (hydrocarbons), may result in a deterioration to water quality including a reduction in dissolved oxygen. This can have a negative impact on any water dependent species present. The immiscible nature of hydrocarbons would affect dilution until degradation is achieved. Concrete and cement are highly alkaline. Concrete wash water is a particularly severe pollutant, as it typically has a high pH (11–12) coupled with high suspended sediment content. In the freshwater environment, pH levels which are elevated beyond natural conditions can have impacts upon water bodies.

5.8.4.2 Hydromorphology

5.8.4.2.1 Construction Impact 5 – Removal of Riparian Vegetation

321. Vegetation clearance/topsoil stripping and tracking of plant and machinery within a water body floodplain has the potential to increase fine sediment release to water bodies through accelerated fluvial activity. Damage to the bank top/face also has the potential to lead to increases in the rate of bank erosion, altering the cross section of the water body. Construction within the floodplain may lead to possible reduction in riparian corridor extents and composition along water bodies, reduction in habitat diversity and bank stability and increased risk of bank retreat.

322. The changes to water body hydromorphology may potentially lead to changes in river processes and habitats upstream and downstream, and impacts may be extended for a short term beyond the Construction Phase until vegetation re-establishes.

5.8.4.2.2 Construction Impact 6 – Release of Silty Water

323. The mechanisms for this impact are described in Construction Impact 2. Increases in silty water can lead to smothering of hydromorphological features. Additional changes to the type, size and shape of sediment as a result of increased silty runoff can alter hydromorphological process and induce hydromorphological change at and downstream of the discharge location.

5.8.4.2.3 Construction Impact 7 – Temporary Bridge Crossings

324. All proposed temporary bridge crossings to facilitate access to works areas would be clear span and would not interact with the water body bed, substrate or flow regime. However, the placement of temporary crossings may require the removal of riparian vegetation, with similar impacts to those described for Construction Impact 5.

5.8.4.3 Summary of Construction Phase Effects

325. A summary of pre-mitigation Construction Phase effects is provided in Table 5.32.

Table 5.32: Pre-mitigation Summary of Construction Phase Effects on Water Bodies for the Proposed 38 kV Uprate Works

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Proposed 38 kV Uprate Works – WFD Designated Water Bodies					
Blackwater (Clare)_020: PSNWCX001 to PSNWCX003	**Main Activities:** • Three overhead power line crossings of separate tributaries of the Blackwater (Clare)_020 • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossings.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The impacts outlined in Section 5.8.4.1.1 would likely be short-term, confined to the Construction Phase and localised to the works footprint. Additionally, the works footprint is a small proportion of the catchment, the remainder of which would remain unchanged from the baseline. Works are unlikely to cause deterioration to the existing WFD status or prevent the water body from achieving Good status. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts would likely be short-term in nature and confined to the Construction Phase. Impacts would be temporary and at a local scale, but could impact on elements that contribute to WFD classification. However, these impacts are unlikely to impact overall WFD status at water body scale. Without mitigation there is a risk of localised deterioration in water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** The above impacts would be short-term and at the river reach scale (the river from source to sea). Impacts would be temporary and may increase the extent of morphological pressures. This may contribute to, but not cause, a reduction in water body morphology status or WFD classification. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Medium	Medium adverse	Moderate (significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Shannon (Lower)_050 (Main Stem): PSNWCX004	**Main Activities:** • One overhead power line crossing of the main Shannon (Lower)_050 channel • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term, confined to the Construction Phase and localised to the works footprint. Additionally, the works footprint is only a small proportion of the catchment, the remainder of which would remain unchanged from the baseline. Works are unlikely to cause deterioration to the existing WFD status or prevent the water body from achieving Good status. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	Very high	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts would be short-term in nature and would be confined to the Construction Phase. Impacts would be temporary and occur at a local scale. However, while there may be impacts on elements that contribute to WFD classification, it is unlikely to contribute to reduction in water body WFD status. Without mitigation, there is a risk of localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Very high	Medium adverse	Very Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These impacts would be short-term and at the reach scale, and may contribute to, but not cause, a reduction in water body morphology status or overall WFD classification. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Medium	Medium adverse	Moderate (significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Shannon (Lower)_050 (outside of SAC - tributaries): PSNWCX005 & PSNWCX006	**Main Activities:** • Two overhead power line crossings of separate tributaries of the Shannon (Lower)_050 • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term, confined to the Construction Phase and localised to the works footprint. Additionally, the works footprint is only a very small percentage of the catchment, the remainder of which would remain unchanged from the baseline. Works are unlikely to cause deterioration to the existing WFD status or prevent the water body from achieving Good status. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be temporary and at a local scale. However, while there may be impacts to elements that contribute to WFD classification, it is unlikely to contribute to a reduction in water body WFD status. Without mitigation, there is a risk of localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These impacts would be short-term and at the reach scale and may impact elements that contribute to WFD classification. However, it is unlikely that this would cause a reduction in water body morphology status or overall WFD classification. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Medium	Medium adverse	Moderate (significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Kimastulla_050: WCX077	**Main Activities:** • Undergrounding of the proposed power supply line to Birdhill Station – it is assumed that these works would be carried out within the existing road infrastructure • Working adjacent to the water body with plant and machinery • Excavations within the existing road adjacent to and over the water body.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The proposed excavation of the cable trench would take place within the existing road structure which is serviced by existing road drainage. Therefore, no changes to baseline surface water runoff or drainage/flow pathways are anticipated and the pre-mitigation magnitude of impact is assessed as Negligible.	Very high	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Any runoff generated from the works would likely be captured by the existing road drainage network. The existing drainage layout is currently unknown and it is possible that no treatment is currently in place prior to discharge. Therefore, silty runoff and accidental pollution could discharge to the water body, but this would be diluted. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Very high	Low adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** There would be no requirement to remove riparian vegetation as the cable would be laid within the existing road and crossing structure. The existing drainage layout is currently unknown and it is possible that no treatment is currently in place prior to discharge. Therefore, silty runoff could discharge to the water body leading to changes in hydromorphological features, and bed substrate and structure, but runoff would be diluted. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	High	Low adverse	Moderate (significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
Proposed 38 kV Uprate Works – Other Waterbodies					
PSNWBX004, PSNWBX006 to PSNWBX010	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Low	Low adverse	Slight (not significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBX005	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	Negligible	Negligible	Imperceptible
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Negligible	Medium adverse	Not significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Low	Low adverse	Slight (not significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBX001 & PSNWBX002	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Low	Low adverse	Slight (not significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBX003	Main Activities: • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	Medium	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Medium	Medium adverse	Moderate (significant)
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Low	Low adverse	Slight (not significant)

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP030	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	Very high	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk for localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Very high	Medium adverse	Very Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** This water body is straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP008 to PSNWBP020, PSNWBP028 & PSNWBP029, PSNWBP031 to PSNWBP046	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP001 to PSNWBP004 & PSNWBP023	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP049 & PSNWBP050	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP005 to PSNWBP007, PSNWBP024 to PSNWBP027, PSNWBP051 to PSNWBP052, PSNWBP060,	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	Medium	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Medium	Medium adverse	Moderate (significant)
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP047, PSNWBP056 & PSNWBP057	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP048	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** This water body is straightened with likely modified planform and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP053 & PSNWBP054	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP055	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	Medium	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	Medium	Medium adverse	Moderate (significant)
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** This water body is straightened with likely modified planform and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP058, PSNWBP059 & PSNWBP062	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP060, PSNWBP065 to PSNWBP070	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP061 & PSNWBP063	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

Water Body/ID	Attribute	Description of Assessed Specific Impacts	Sensitivity	Pre-Mitigation Magnitude	Significance of Effect (Pre-Mitigation)
PSNWBP064	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets Construction (and use of) temporary clear span bridge crossing.				
	Surface Water Quality and Hydrology	**Construction Impact 1: Changes in surface water runoff/drainage pathways:** The above impacts would be short-term and localised and are unlikely to cause a measurable reduction in runoff rates. Therefore, the pre-mitigation magnitude of impact is assessed as Negligible.	High	Negligible	Not Significant
		Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials: These impacts are short-term in nature and would be confined to the Construction Phase. Impacts would be at a local scale. Without mitigation there is a risk of a localised deterioration in baseline water quality. Therefore, the pre-mitigation magnitude of impact is assessed as Medium adverse.	High	Medium adverse	Significant
	Hydromorphology	**Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings:** These water bodies are straightened with likely modified planforms and limited distinct fluvial features and process. Additionally, impacts would be short-term and at the reach scale. Therefore, the pre-mitigation magnitude of impact is assessed as Low adverse.	Negligible	Low adverse	Not Significant

5.8.5 Construction Phase Mitigation

326. For the overhead line sections, specific mitigation is detailed in the SWMP (W-SC38) (Annex A of Appendix A5.1: CEMP).

327. Generic mitigation measures for use across the Proposed Project are outlined in Section 4.3.

328. For the underground sections, effects would also be addressed through the generic mitigation measures identified in the SWMP.

5.8.6 Construction Phase Residual Effects

329. Following implementation of mitigation and control measures, potential effects identified in Section 5.8.4 would be reduced to Not Significant (see Table 5.33 for a summary).

Table 5.33: Summary of Residual Effects as a Result of Construction for the Proposed 38 kV Uprate Works

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Proposed 38 kV Uprate Works – WFD Designated Water Bodies							
Black Water (Clare)_020: PSNWCX001 to PSNWCX003	**Main Activities:** • Three overhead power line crossing of separate tributaries of the Blackwater (Clare)_020 • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials.	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings.	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Shannon (Lower)_050 (Main Stem): PSNWCX004	**Main Activities:** • One overhead power line crossing of the main Shannon (Lower)_050 channel • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace of polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	Very high	Medium adverse	Very Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings.	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Shannon (Lower)_050 (outside of SAC - tributaries): PSNWCX005 & PSNWCX006	**Main Activities:** • Two overhead power line crossing of separate tributaries of the Shannon (Lower)_050 • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials.	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings.	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Kilmastulla_050: WCX077	**Main Activities:** • Undergrounding of the proposed power supply line to Birdhill Station – it is assumed that these works would be carried out within the existing road infrastructure • Working adjacent to the water body with plant and machinery • Excavations within the road adjacent to and over the water body.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials.	Very high	Low adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings.	High	Low adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Proposed 38 kV Uprate Works – Other Waterbodies							
PSNWBX004 & PSNWBX006 to PSNWBX010	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials.	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings.	Low	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBX001 & PSNWBX002	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials.	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings	Low	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
PSNWBX003	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials.	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
Hydromorphology	Construction Impacts 5, 6 and 7: Removal of riparian vegetation, Release of silty water, and Temporary Bridge Crossings	Low	Low adverse	Slight (not significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP030	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	Very high	Medium adverse	Very Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP008 to PSNWBP020, PSNWBP028 & PSNWBP029, PSNWBP031 to PSNWBP046	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP001 to PSNWBP004 & PSNWBP023	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP049 & PSNWBP050	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP005 to PSNWBP007, PSNWBP024 to PSNWBP027, PSNWBP051 to PSNWBP052, PSNWBP060,	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP047, PSNWBP056 & PSNWBP057	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP048	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP053 & PSNWBP054	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP055	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	Medium	Medium adverse	Moderate (significant)	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP058, PSNWBP059 & PSNWBP062	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP060, PSNWBP065 to PSNWBP070	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						

Water Body Name/ID and Attribute	Potential Impact	Sensitivity	Pre-Mitigation		Mitigation ID	Post-Mitigation	
			Magnitude	Significance of Effect		Magnitude	Residual Significance of Effect
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP061 & PSNWBP063	**Main Activities:** • One overhead power line crossing on each of the listed water bodies • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant
PSNWBP064	**Main Activities:** • Working adjacent to the water body with plant and machinery • Excavations adjacent to the water body to replace polesets • Construction (and use of) temporary clear span bridge crossing.						
Surface Water Quality and Hydrology	Construction Impacts 2, 3 and 4: Release of silty water, Increased erosion of exposed surfaces, and Accidental release of polluting materials	High	Medium adverse	Significant	Generic mitigation detailed in the SWMP (Annex A of Appendix A5.1); W-SC38	Negligible	Not Significant

5.8.7 Operational Phase Assessment of Effects

330. Details of the general layout and design for the Proposed 38 kV Uprate Works are provided in Chapter 4 (Proposed Project Description). Power supply upgrades would operate overhead and above ground; no interaction with water bodies is expected. Therefore, the magnitude of impacts for all water bodies listed in Table 5.31 is assessed as negligible. This results in no significant effects during the Operational Phase.

5.8.8 Operational Phase Mitigation and Residual Effects

331. Design embedded mitigation described in Section 4.2 would avoid significant effects as a result of the operation of the Proposed 38 kV Uprate Works. Therefore, no further mitigation measures would be required and there would be no residual effects.

5.9 Summary of Residual Effects from all Non-Linear Principal Infrastructure

332. Following implementation of mitigation and control measures, effects identified from all non-linear infrastructure and the Proposed 38 kV Uprate Works sites would be Not Significant.

6. References

CIRIA (2015). The SuDS Manual (C753).

CIRIA (2016). Groundwater control: design and practice (second edition) (C750).

Department of Housing, Local Government and Heritage (2024). Water Action Plan 2024: A River Basin Management Plan for Ireland.

Environmental Protection Agency (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports [Online]. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf [Accessed October 2025].

Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters [Online]. Available at: https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Guidelines%20Report%202016.pdf [Accessed October 2025].

Office of Public Works (2009). The Planning System and Flood Risk Management Guidelines for Planning Authorities [Online]. Available at: https://assets.gov.ie/static/documents/the-planning-system-and-flood-risk-management-guidelines-for-planning-authorities-nov-.pdf [Accessed October 2025].

7. Figures

N

Derg TN

Derg HMWB
(Parteen Basin)

SHANNON (LOWER)_040

GRANGE (TIPPERARY)_010

SHANNON (LOWER)_050

KILMASTULLA_050

ARDCLOONY_010

BRIDGETOWN (CLARE)_010

BALLYARD_010

Note :-
Planning Application Boundary is for information purposes only and title will be reflected in acquisition mapping'

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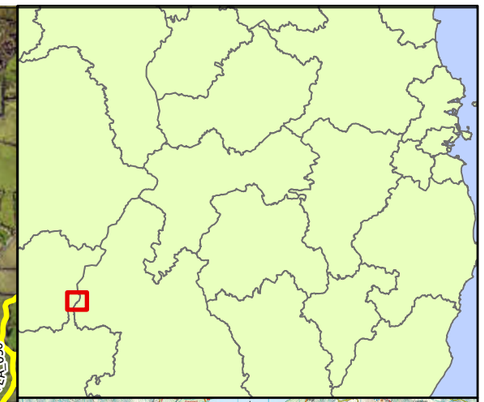

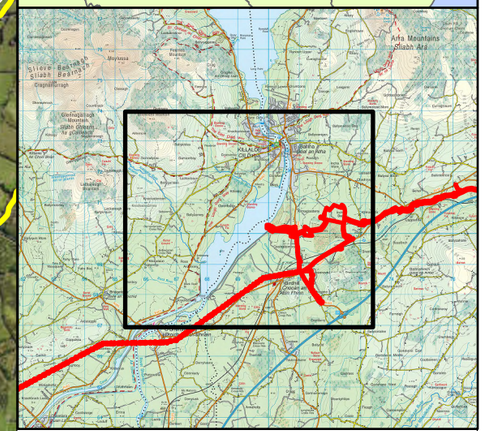

Legend

Planning Application Boundary

River Waterbody WFD Status 2019-2024

WFD Ecological Status

Good

Moderate

Poor

Lake Waterbody WFD Status 2019-2024

WFD Ecological Status

Good

Moderate

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	11/03/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	JL	PW	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
A9.3 Figure 1
Derg HMWB (Parteen Basin)

Drawing Status: **FINAL – PLANNING APPLICATION**

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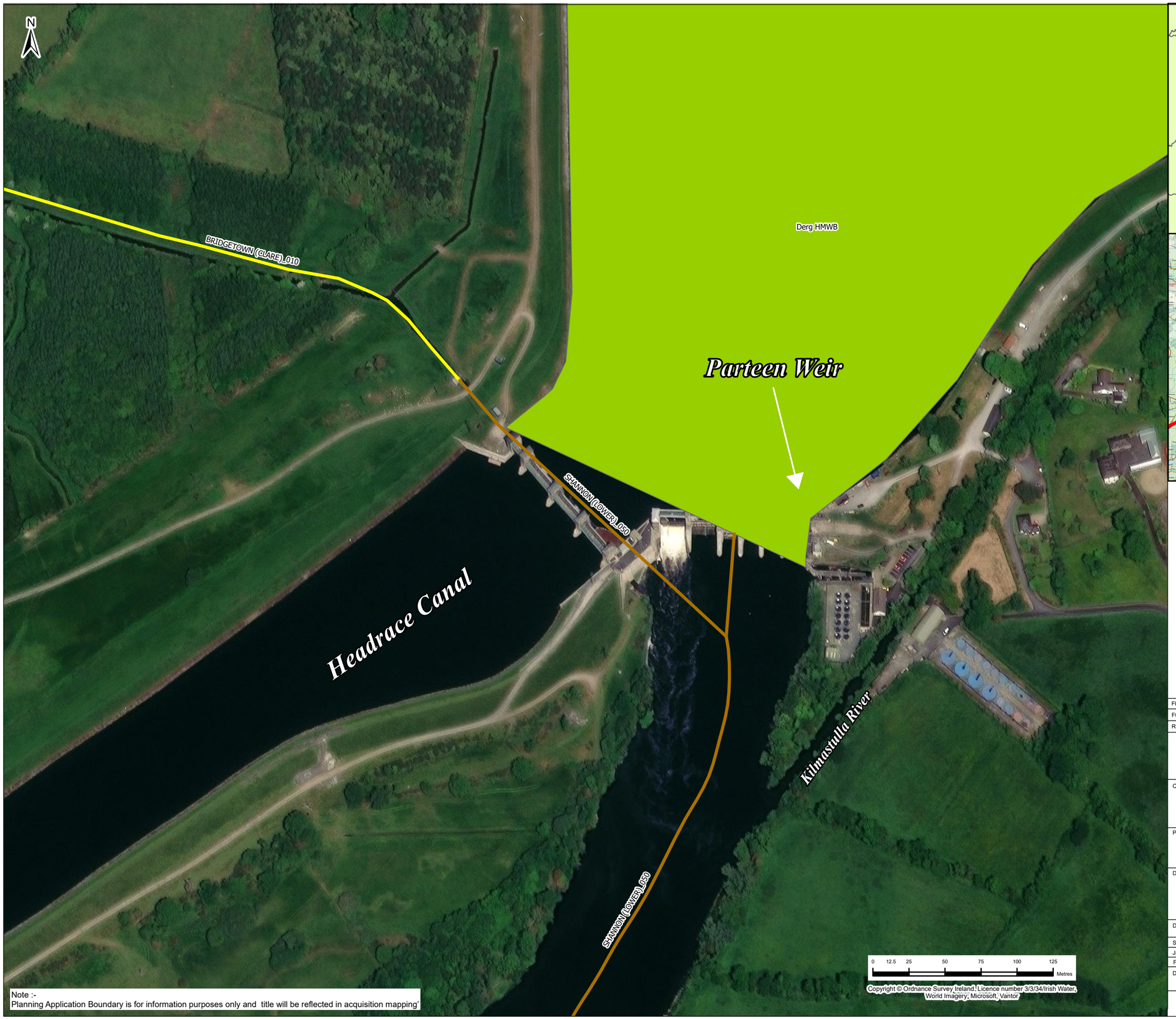

Note :-
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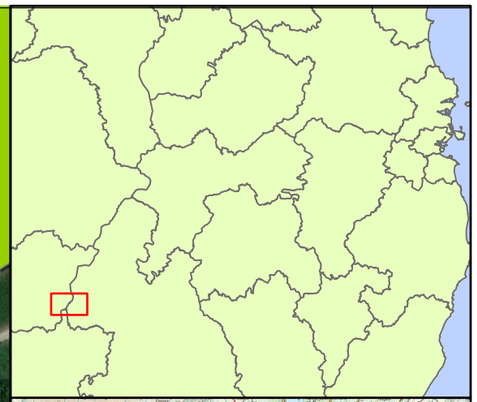

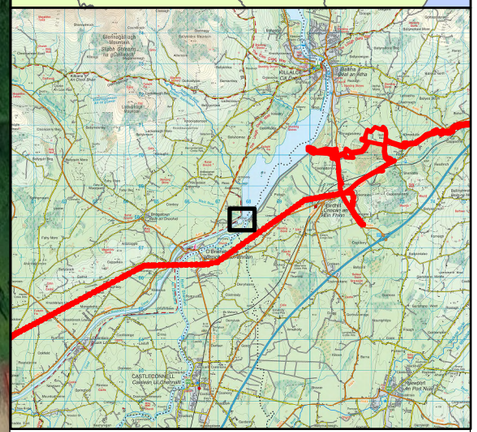

Legend

River Waterbody WFD Status 2019-2024

WFD Ecological Status

Moderate

Poor

Lake Waterbody WFD Status 2019-2024

WFD Ecological Status

Good

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	11/03/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	JL	PW	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: A9.3 Figure 2
Parteen Weir

Drawing Status: **FINAL – PLANNING APPLICATION**

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N

SHANNON (LOWER)_040
Derg TN
GRANGE (TIPPERARY)_010
SHANNON (LOWER)_050
KILMASTULLA_050
Derg HMWB
WBX090
WBX091
WCX004
WBX002
WBX003
WBX004
WCX003
WCX002
WBX001
WCX077
WCX001
PSNWBX007
ARDCLOONY_010
BRIDGETOWN (CLARE)_010
PSNWBX006
PSNWBX008
PSNWBX009
PSNWBX010
BALLYARD_010
PSNWCX006

Note :-
Planning Application Boundary is for information purposes only and title will be reflected in acquisition mapping'

0 0.25 0.5 1 1.5 2 2.5 Kilometres

Legend

- Planning Application Boundary
- Infrastructure Sites
- Infrastructure Sites Study Area (50m Buffer)
- Special Area of Conservation
- Proposed Natural Heritage Areas
- WFD Nutrient Sensitive Lakes
- Peat (source: Teagasc)
- Tunnel/Trenchless Crossing
- Watercourse Crossing (EPA) (WCX)
- Watercourse Crossing (WBX)
- Potential Waterbody Crossing (WBP)

River Waterbody WFD Status 2019-2024
WFD Ecological Status
- Good
- Moderate
- Poor

Lake Waterbody WFD Status 2019-2024
WFD Ecological Status
- Good
- Moderate

Rev.	Date		Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	03/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water; Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: A9.3 Figure 3
Parteen Basin Study Area

Drawing Status: **FINAL – PLANNING APPLICATION**

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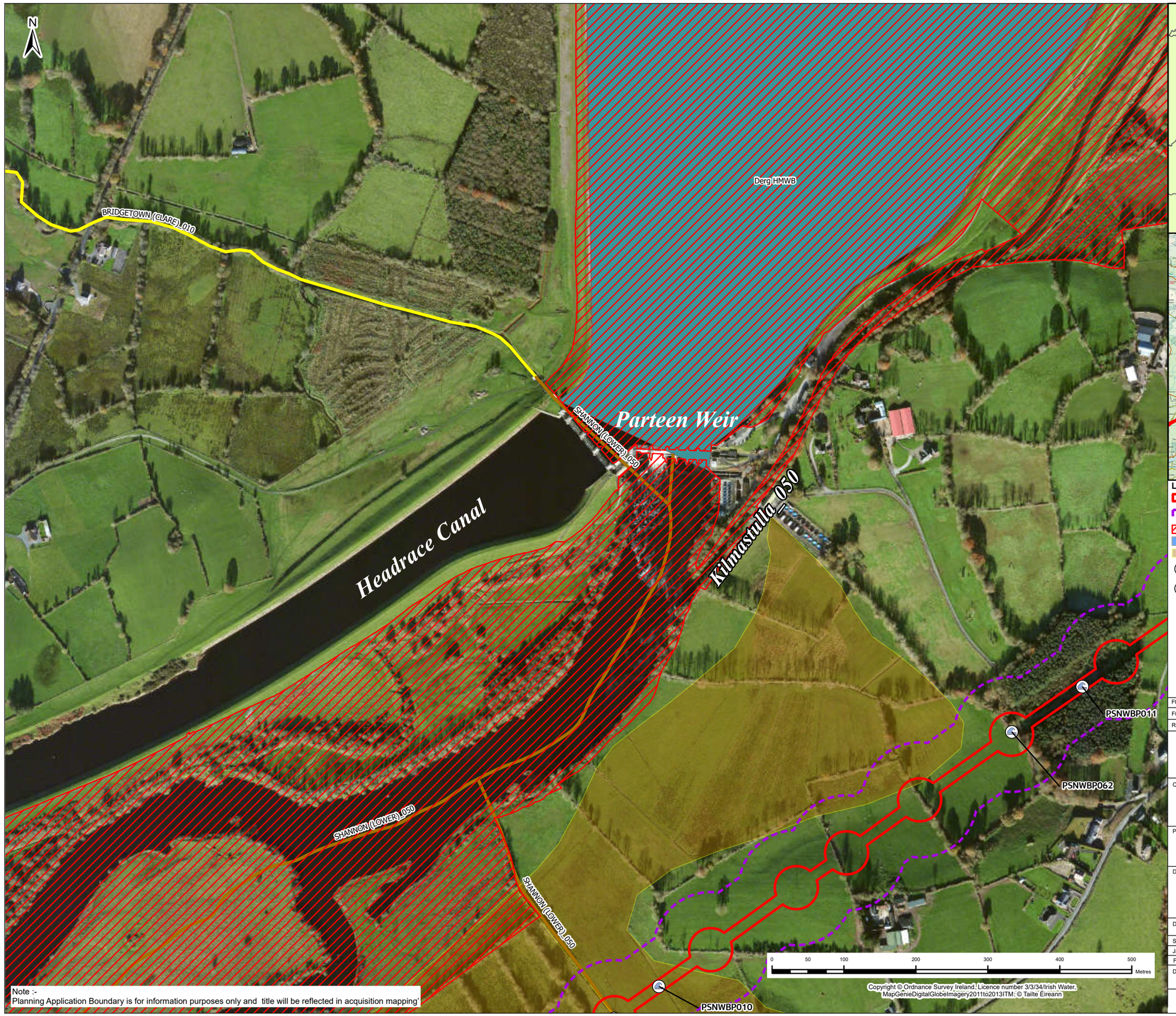

Note :-
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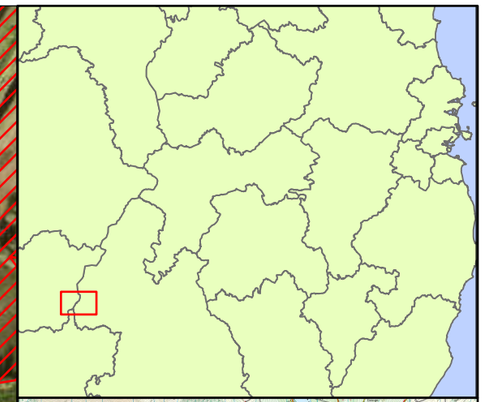

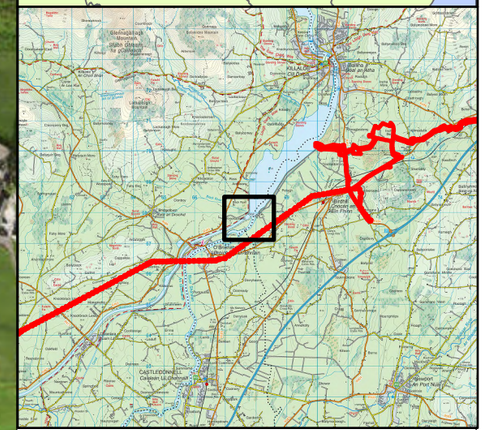

Legend

- Planning Application Boundary
- Infrastructure Sites Study Area (50m Buffer)
- Special Area of Conservation
- WFD Nutrient Sensitive Lakes
- Peat (source: Teagasc)
- Watercourse Crossing (EPA) (WCX)
- Potential Waterbody Crossing (WBP)

Lake Waterbody WFD Status 2019-2024
WFD Ecological Status
- Good

River Waterbody WFD Status 2019-2024
WFD Ecological Status
- Moderate
- Poor

Rev.	Date	Drawn	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	03/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water — Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
A9.3 Figure 4
Parteen Weir Study Area

Drawing Status: **FINAL – PLANNING APPLICATION**

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Note :-
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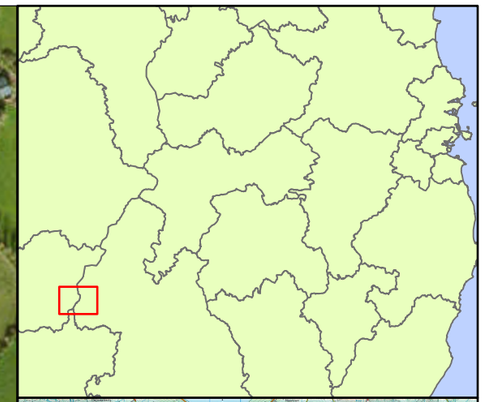

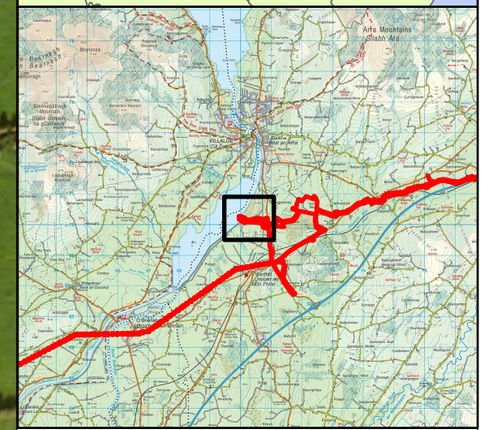

Legend

- Planning Application Boundary
- Raw Water Intake and Pumping Station
- Infrastructure Sites Study Area (50m Buffer)
- Special Area of Conservation
- Infrastructure Sites Access Roads
- Tunnel/Trenchless Crossing
- Watercourse Crossing (EPA) (WCX)
- Watercourse Crossing (WBX)
- Potential Waterbody Crossing (WBP)
- WFD Nutrient Sensitive Lakes

River Waterbody WFD Status 2019-2024
WFD Ecological Status
- Moderate

Lake Waterbody WFD Status 2019-2024
WFD Ecological Status
- Good

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	03/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water — Tionscadal Soláthair Uisce Water Supply Project

Project
Water Supply Project
Eastern and Midlands Region

Drawing Title
A9.3 Figure 5
RWI & PS Study Area

Drawing Status: **FINAL – PLANNING APPLICATION**

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WBX090

WTP

WBP063

WBP175

WBP321

WBX091

WBP322

WBP220

WBX004

WBX003

WBP320

WBP221

WCX002

WCX001

WBP308

KILMASTULLA 050

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KILMASTULLA 050

0 50 100 200 300 400 500 Metres

Note :-
Planning Application Boundary is for information purposes only and title will be reflected in acquisition mapping'

Legend

- Planning Application Boundary
- Water Treatment Plant
- Infrastructure Sites Study Area (50m Buffer)
- Special Area of Conservation
- WFD Nutrient Sensitive Lakes
- Tunnel/Trenchless Crossing
- Watercourse Crossing (EPA)(WCX)
- Watercourse Crossing (WBX)
- Potential Waterbody Crossing (WBP)

River Waterbody WFD Status 2019-2024

WFD Ecological Status

- Moderate
- Poor

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	04/12/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water — Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

A9.3 Figure 6
WTP Study Area

Drawing Status: **FINAL – PLANNING APPLICATION**

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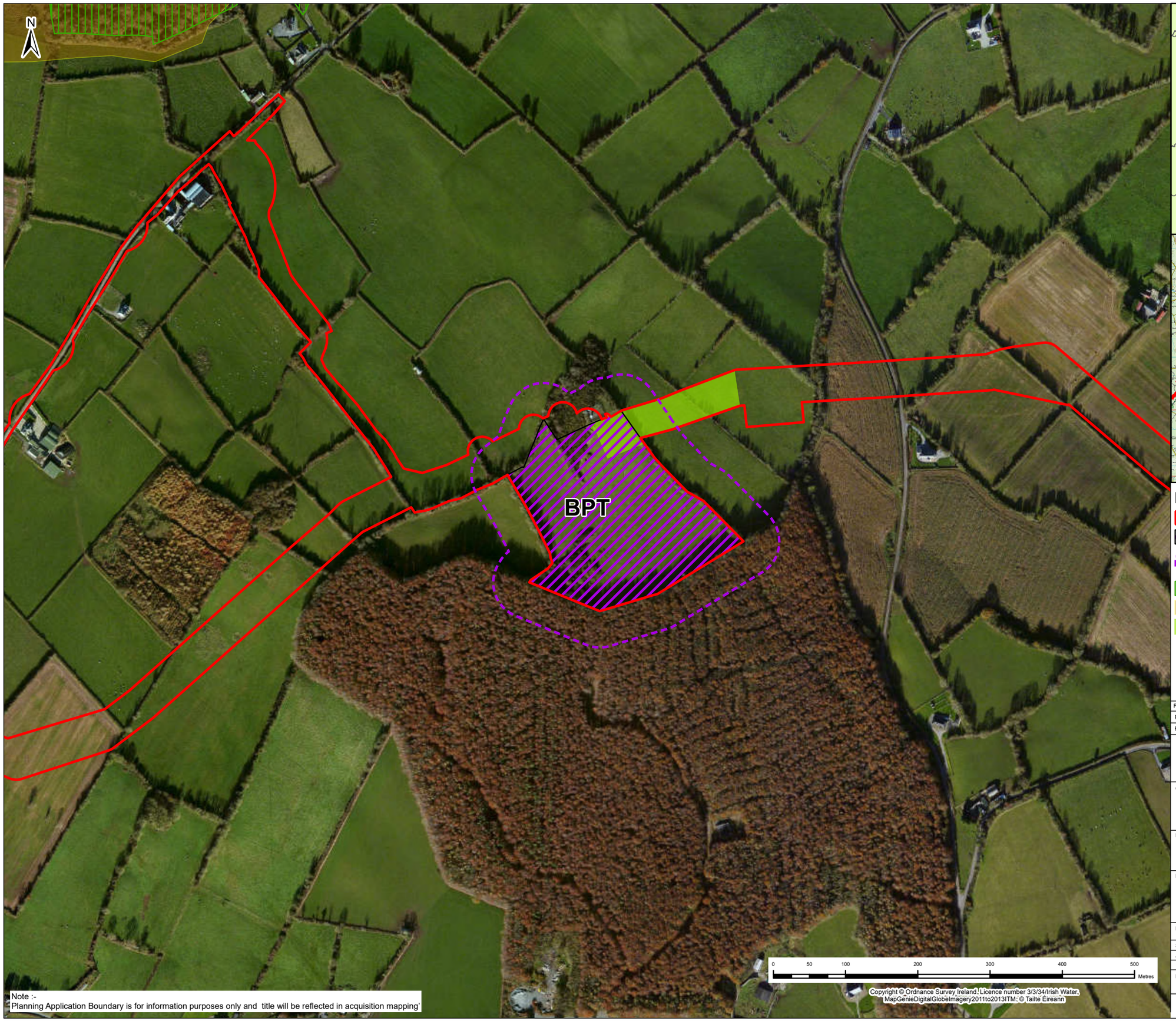

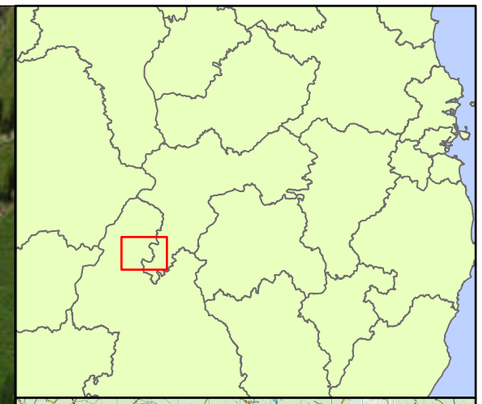

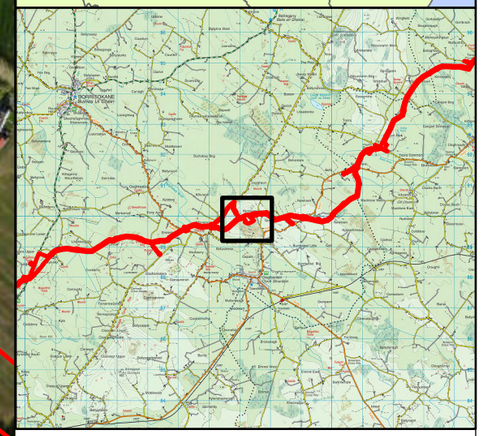

Note :-
Planning Application Boundary is for information purposes only and title will be reflected in acquisition mapping'

Legend

- Planning Application Boundary
- Break Pressure Tank
- Infrastructure Sites Study Area (50m Buffer)
- Natural Heritage Areas
- Peat (source: Teagasc)
- Tunnel/Trenchless Crossing

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	27/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water — Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: A9.3 Figure 7
BPT Study Area

Drawing Status: **FINAL – PLANNING APPLICATION**

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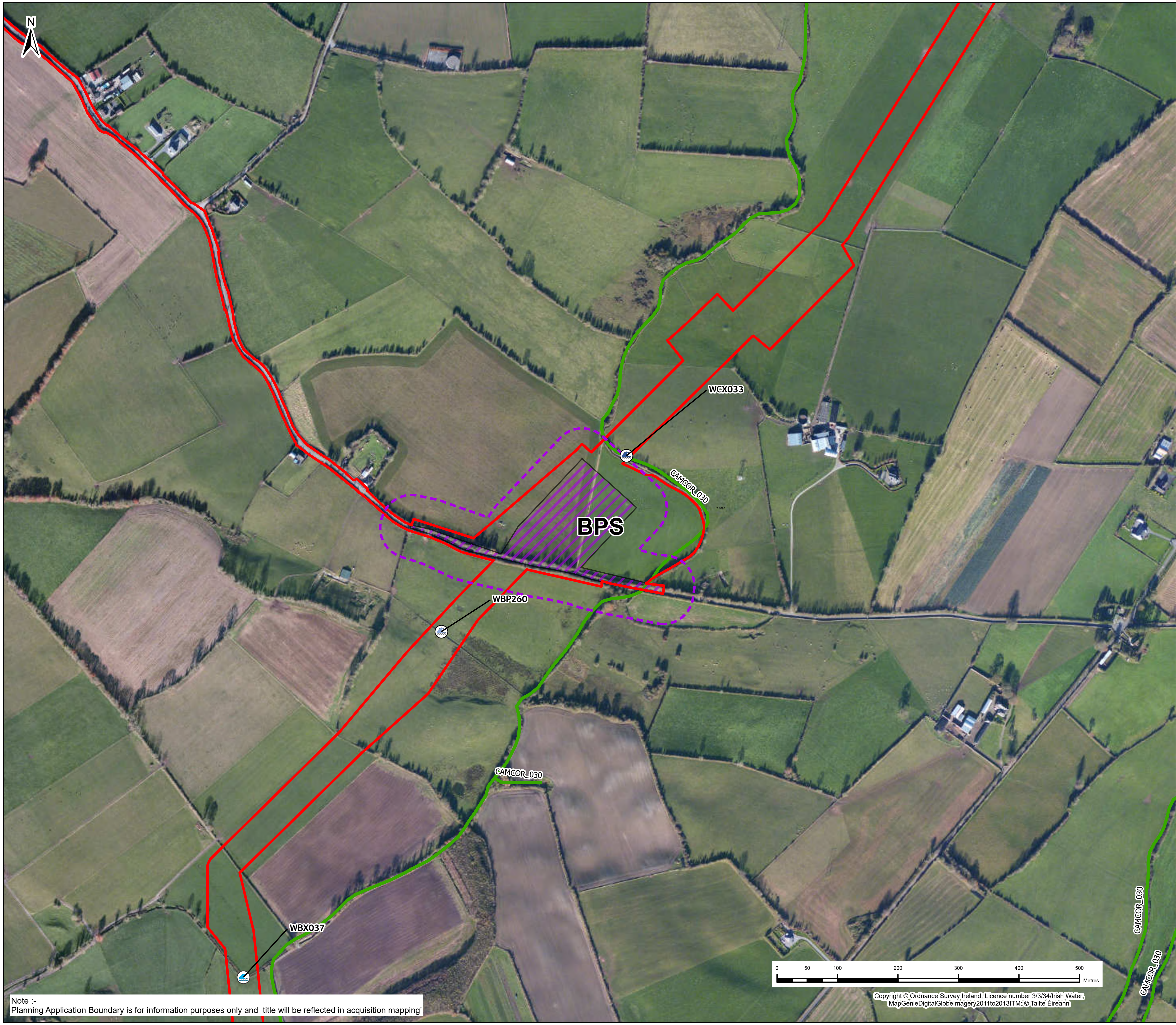

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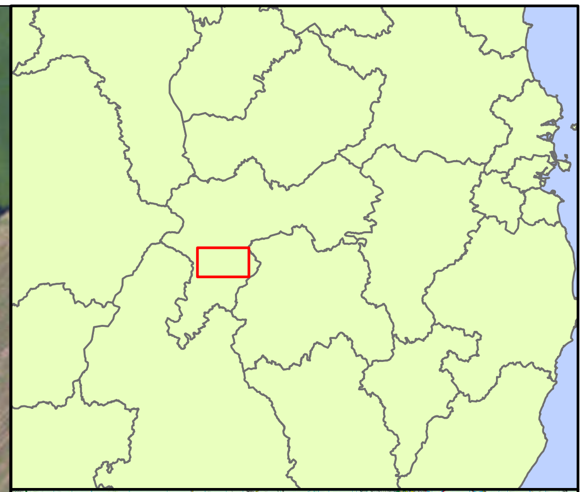

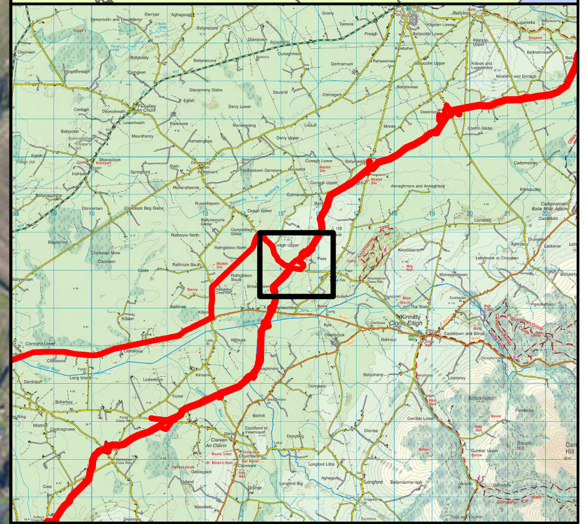

Legend

- Planning Application Boundary
- Booster Pumping Station
- Infrastructure Sites Study Area (50m Buffer)
- Watercourse Crossing (EPA)(WCX)
- Watercourse Crossing (WBX)
- Potential Waterbody Crossing (WBP)

River Waterbody WFD Status 2019-2024

WFD Ecological Status

- Good

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	27/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

A9.3 Figure 8
BPS Study Area

Drawing Status

FOR APPROVAL

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Note :-
Planning Application Boundary is for information purposes only and title will be reflected in acquisition mapping'

Legend

- Planning Application Boundary
- Flow Control Valve
- Infrastructure Sites Study Area (50m Buffer)
- Proposed Natural Heritage Areas
- WFD Nutrient Sensitive Rivers
- Tunnel/Trenchless Crossing
- Potential Waterbody Crossing (WBP)
- Watercourse Crossing (EPA)(WCX)

River Waterbody WFD Status 2019-2024

WFD Ecological Status

- Good

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	27/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client: Uisce Éireann Irish Water — Tionscadal Soláthair Uisce Water Supply Project

Project: Water Supply Project
Eastern and Midlands Region

Drawing Title: A9.3 Figure 9
FCV Study Area

Drawing Status: **FINAL – PLANNING APPLICATION**

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Note :-
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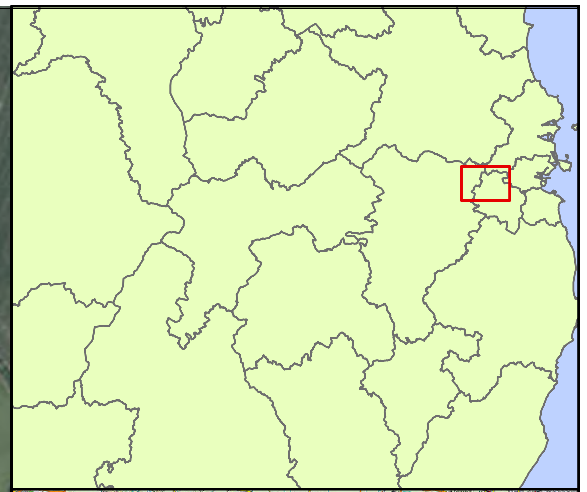

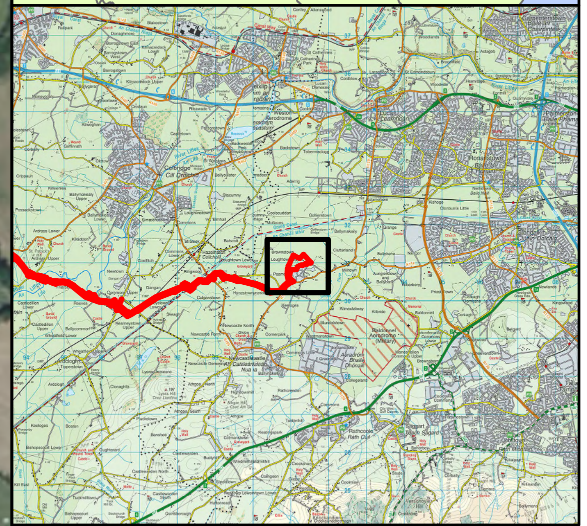

Legend

- Planning Application Boundary
- Termination Point Reservoir
- Infrastructure Sites Study Area (50m Buffer)
- Potential Waterbody Crossing (WBP)

River Waterbody WFD Status 2019-2024

WFD Ecological Status

- Poor

Rev.	Date	RLB	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
F02	27/11/2025	16	FINAL - PLANNING PERMISSION	EA	PG	KK	SW
F01	10/10/2025	14	FOR APPROVAL	SA	GQ	HS	SW

Jacobs TOBIN

Client

Uisce Éireann Irish Water

Tionscadal Soláthair Uisce Water Supply Project

Project

Water Supply Project
Eastern and Midlands Region

Drawing Title

A9.3 Figure 10
TPR Study Area

Drawing Status

FINAL – PLANNING APPLICATION

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