



Appendix 12.1 **Water Framework** **Directive Assessment**

Ballina Flood Relief Scheme

Compliance with EU Water Framework Directive (WFD)
(2000/60/EC)

Water Body Status Assessments

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Acronyms

BQE	Biological Quality Elements
CIS	Common Implementation Strategy
CJEU	Court of Justice of the European Union
EclA	Ecological Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EQR	Environmental Quality Ratio
EQS	Environmental Quality Standard
GPC	General physico-chemical
GWB	Ground water body
GWDTE	Groundwater dependent terrestrial ecosystems
RBMP	River Basin Management Plan
RWB	River water body
WFD	Water Framework Directive

Glossary of Terms

Ecological status	Ecological status classification for the body of water shall be represented by the lower of the values for the biological and physico-chemical monitoring results (Annex V, 1.4.2)
Good ecological status	Article 2 (22) defines good ecological status as classified in accordance with Annex V which states GES is when <i>“there are slight changes in the [specific biological quality element] compared to the type-specific communities”</i> .
Good surface water status	Article 2(18) of the WFD: <i>“the status achieved by a surface water body when both its ecological status and its chemical status are at least ‘good’”</i>
Good surface water chemical status	Physicochemical and nutrient conditions are within the ranges established to ensure the functioning of the ecosystem and the achievement of the values specified for the biological quality elements and (Article 2 (24) of the WFD) <i>“in which concentrations of pollutants do not exceed the established environmental quality standards”</i> .
Surface water status	Article 2(17) of the WFD: <i>“the general expression of the status of a body of surface water, determined by the poorer of the ecological status and the physicochemical status”</i>

1 INTRODUCTION

The proposed Ballina Flood Relief Scheme, Co Mayo (the “Proposed Scheme”) involves new physical modifications to discrete reaches of the River Moy and four of its tributaries: Brusna (Glenree) River, Quignamanger, Bunree and Tullyegan.

New physical modifications can impact on hydromorphology of surface waters, potentially undermining the achievement of Article 4(1) environmental objectives under the Water Framework Directive 2000/60/EC (WFD). Article 4(1) requires for all water bodies that deterioration in status must be prevented, and good status must be achieved within certain timeframes as set out in the directive.

Alterations to the physical condition of a water body can impact on aquatic ecosystems, with consequent effects on biological quality elements and the metrics that determine surface water body status. New physical modifications also have potential to alter the quantitative status of groundwaters with potential effects on connected surface waters and/or groundwater dependent terrestrial ecosystems (GWDTE).

A key decision in the European Court of Justice (CJEU) concerning hydromorphological impact on water body status came from the ¹Weser case, establishing that: “Member States are required — unless a derogation is granted — to refuse authorisation for an individual project where it may cause a deterioration of the status of a body of surface water or where it jeopardises the attainment of good surface water status ... by the date laid down by the directive.”

The aim of this document is to provide the assessment of whether new physical modifications under the Proposed Scheme could prevent WFD Article 4(1) objectives from being achieved for any water body and whether the project can be authorised under the WFD.

2 METHODOLOGY AND SOURCES OF INFORMATION

2.1 Resources

The following resources were consulted to inform this response:

- Water Framework Directive (2000/60/EC) full text
- WFD Common Implementation Strategy (CIS) Guidance documents (EC 2005, 2006, 2009, 2017)
- Water Action Plan 2024: A River Basin Management Plan for Ireland (DHLGH, 2024)
- EIAR for the Ballina Flood Relief Scheme
- Relevant Litigation relating to WFD, i.e., *Case C-461/13 Bund für Umwelt und Naturschutz Deutschland* ECLI:EU:C:2015:433 (the *Weser* case)
- Environmental Protection Agency (EPA) maps and data: <https://www.catchments.ie/>
- Historical OSI maps: <https://www.geohive.ie>
- Published scientific literature / journals, where required.

2.2 Water Body Status Impact Assessments

2.2.1 Purpose of Water Body Status Impact Assessment

Ireland has obligations under the WFD to manage the physical condition of all waters to protect and improve their status. Amongst actions identified in Ireland’s 2nd cycle (2016-2021) River Basin Management Plan (RBMP) was delivery of guidelines for planning authorities on the relationship between hydromorphology and river basin management to address physical pressures on water body status. That work has been carried over within the Water Action Plan 2024: A River Basin Management Plan for Ireland which introduces specific Programme of Measures for hydromorphology and WFD compliance. As of September 2024 (when the current document was finalised) there are no

¹ *Case C-461/13 Bund für Umwelt und Naturschutz Deutschland* ECLI:EU:C:2015:433

published national guidelines relating to water body status impact assessment. However, European Union (EU) Guidance on Common Implementation Strategy (CIS) for the WFD provides the approach required for such assessments.

To clearly inform the Competent Authority in assessing compliance of the Proposed Scheme with WFD Article 4(1) objectives, water body status impact assessments are undertaken in this document using a structured approach that is in line with: (i) EU CIS Guidance, (ii) relevant case law pertaining to WFD interpretation / application, and (iii) goals of the Draft 3rd Cycle of the River Basin Management Plan (2022-2027) for Ireland. Article 4(7) Applicability Assessment

Article 4(7) of the WFD sets out rules around the authorisation of projects that involve new modifications to the physical characteristics of a body of surface water and/or alterations to the level of bodies of groundwater. If a project may lead to deterioration of status or non-achievement of good status it cannot be authorised unless it meets strict criteria under Article 4(7) to qualify for an exemption from the core objectives of the WFD.

Article 4(7) considerations apply to any project that involves a new physical alteration to a water body (such as a flood relief scheme) and/or changes to ground water levels that may affect its quantitative status. It must be determined prior to authorisation whether the project could compromise WFD objectives. The framework for this process is contained in *CIS Guidance No. 36: Exemptions to the Environmental Objectives according to Article 4(7) New modifications to the physical characteristics of surface water bodies, alterations to the level of groundwater, or new sustainable human development activities* (EC 2017).

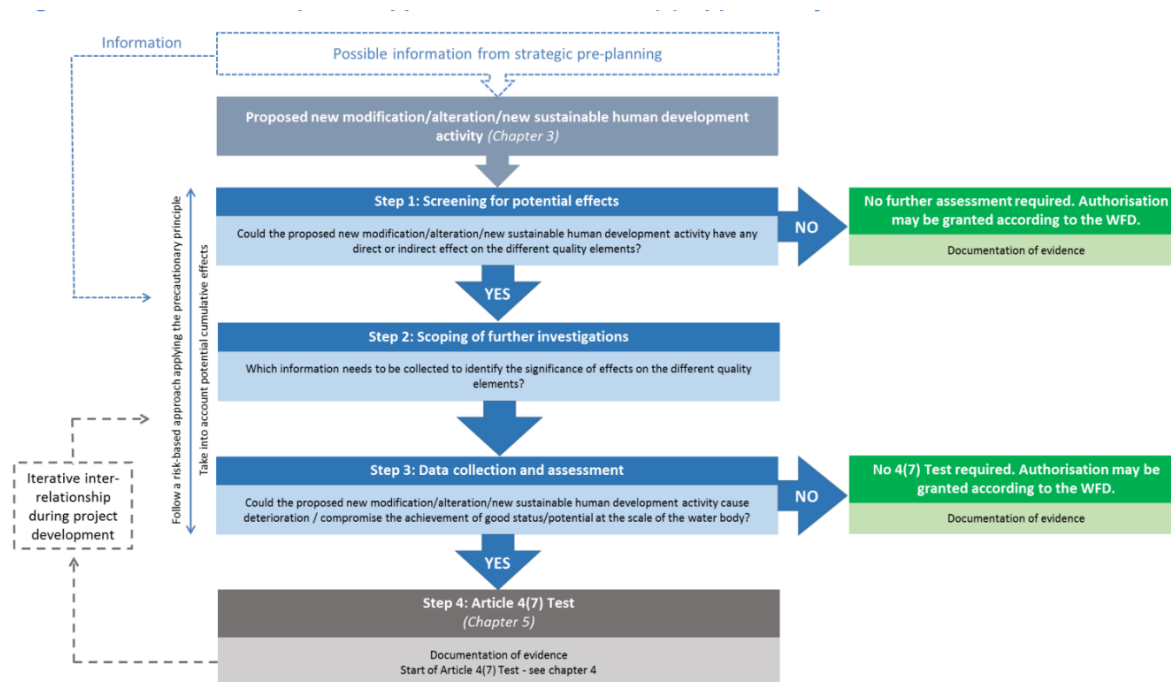


Figure 2-1 Stepwise approach for an Article 4(7) Applicability Assessment (reproduced from EC 2017)

The first step involves what is termed the "Article 4(7) Applicability Assessment" which evaluates how a proposed project is expected to impact on environmental objectives for each water body and to answer the questions: (1) does the proposal lead to deterioration of water body status? or (2) does the proposal prevent attainment of good status?

As shown in **Figure 2-1**, above, if the answer to either question is "yes" the project can only be authorised under derogation using an "Article 4(7) Test" to determine if it meets criteria for exemption as set out within the directive. If the answer to both questions is "No" the project is compliant with WFD Article 4(1) objectives and can be authorised under the WFD.

2.2.2 Meaning of “Deterioration”

The concept of “deterioration” of water body status is not defined in the WFD. The decision provided by the CJUE in the *Weser* case, provided the following clarifications on the way in which deterioration in the context of WFD compliance should be interpreted:

- Deterioration in water body status occurs when the status of at least one of the quality elements, within the meaning of Annex V to the directive, falls by one class, even if this does not result in a fall in the overall classification of the water body.
- If the quality element is already in the lowest class (bad status), any deterioration of that element represents a deterioration of the status within the meaning of WFD Article 4(1)(a)(i).

With regards to WFD assessments the following are important to note:

- Temporary short-term effects on status during the construction or maintenance phase do not constitute “deterioration of status” and are not required to be addressed so long as there are no long-term adverse consequences and no delayed deterioration in the status of the defining quality elements expected in the water body thereafter (EC, 2017).
- Mitigation measures within the proposed project are taken into account in the Article 4(7) Applicability Assessment as they form an inherent element of the design and implementation of a project (EC, 2017).

2.2.3 Information Sources for WFD Assessments

WFD assessments use current EPA assigned water body status classifications (2016-2021) as the baseline against which any effects of the scheme are assessed. These are the most recent formal status classifications reported to Europe going into the RBMP 3rd cycle (2022-2027) under the Water Action Plan 2024 (DHLGH, 2024). This is in line with case law from the Irish High Court *Sweetman v An Bord Pleanála [2021] IEHC 16* which established that EPA assigned status is the only legal baseline against which potential changes to water body status can be evaluated.

The WFD status assessments set out below are underpinned by detailed information provided in the EIAR for the Proposed Scheme, pertaining to impacts and effects on surface and ground water quality and instream habitats that support the biological quality elements that define surface water body status. This document does not reassess the information contained in the EIAR but uses the detailed information and conclusions from the EIAR **Chapter 9: Aquatic Biodiversity, Chapter 11: Land, Soils, Geology and Hydrogeology** and **Chapter 12: Water**.

2.2.4 Surface Water Body Status Classification

For river water bodies, transitional and coastal water bodies ecological status is defined in Annex V of the WFD by biological quality elements (BQEs) as well as hydromorphological, chemical and physico-chemical elements that support the biological elements.

Biological quality elements (e.g., macroinvertebrates, algae, fish) employ standard methods for calculating a metric to reflect an Ecological Quality Ratio (EQR), which equates to WFD status classes of High, Good, Moderate, Poor or Bad. Physicochemical quality elements are compared to statutory Environmental Quality Standards (EQSs) published in the surface water regulations supporting High, Good and ≥Moderate status. Hydromorphology underpins structure and function of river ecosystems, hence ‘supporting the biological quality elements (BQEs).

Hydromorphological quality elements that support the BQEs for **river water bodies** are defined by:

- Hydrological regime (quantity and dynamics of water flow; connection to groundwater bodies)
- River continuity
- Morphological conditions (river depth and width variation; structure and substrate of the river bed, structure of the riparian zone)

Hydromorphological quality elements that support the BQEs for **transitional waters** are defined by:

- Morphological conditions (depth variation; quantity, structure and substrate of the bed; structure of the intertidal zone)

- Tidal Regime (freshwater flow; wave exposure)

Hydromorphological quality elements that support the BQEs for **coastal waters** are defined by:

- Morphological conditions (depth variation; structure and substrate of the coastal bed, structure of the intertidal zone)
- Tidal Regime (direction of dominant currents, wave exposure)

The above are the physical attributes by which any impacts of the Proposed Scheme on surface water body status were assessed in this report.

2.2.5 Ground Water Body Status Classification

Groundwater body status is defined by its chemical status (concentration of pollutants) and its quantitative status (relating to ground water levels). Groundwater status is defined as being either 'Good' or 'Poor' based on the poorest of these elements. Good chemical status is defined in WFD Annex V 2.3.2 and includes meeting EQSs for pollutants, with no declining trends. The definition of good quantitative status is set out in WFD Annex V 2.1.2 (CIS Guidance No. 18, 2009). For a groundwater body to be of good quantitative status the following criteria covered by the definition of good status must be met:

- Available groundwater resource is not exceeded by the long-term annual average rate of abstraction.
- No significant diminution of surface water chemistry and/or ecology resulting from anthropogenic water level alteration or change in flow conditions that would lead to failure of relevant WFD Article 4 objectives for any associated surface water bodies.
- No significant damage to groundwater dependent terrestrial ecosystems resulting from an anthropogenic water level alteration.
- No saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.

These are the attributes by which any impacts of the Proposed Scheme on GWB quantitative status were assessed in this report.

2.2.6 Approach to Water Body Status Impact Assessment

The WFD assessments take the form of individual Article 4(7) Applicability Assessments to examine the effect of new physical modifications on the quality elements that define status. The method is devised by the author using the framework set out in European CIS Guidance No 36 (2017). River water bodies (RWBs), groundwater bodies (GWBs) and the Moy Estuary transitional water are addressed. The following steps were taken:

- Identification of water bodies directly affected by the proposed scheme (i.e., subject to new physical alterations).
- Identification of water bodies that may be indirectly affected by the proposed scheme (i.e., not directly subject to physical alterations but are adjoining upstream / downstream of the project).
- Compile EPA assigned status and quality elements used to define status for each water body including biological and supporting general physico-chemical (GPC) (and chemical status where available).
- Carry out Article 4(7) Applicability Assessment to evaluate effects of new physical modification(s) on ecological status of each potentially affected water body.
- Determine for each water body whether the Proposed Scheme could cause status to deteriorate or prevent achievement of good status.

2.3 Statement of Competence

Lauren Williams BSc PGDip MCIEEM is a qualified freshwater ecologist with over 20yrs professional consultancy experience. Lauren holds a BSc in Zoology (University of Otago, NZ); a Certificate in Environmental Law (Open Polytechnic of NZ) and a Post Graduate Diploma in Environmental

Monitoring Assessment and Engineering with Distinction from Trinity College Dublin. She is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Lauren specialises in water quality assessment, monitoring, aquatic Ecological Impact Assessment (EclA), protected aquatic species and fisheries habitat surveys. She has undertaken specialised aquatic field studies and reporting in relation to a broad range of infrastructural developments including road, rail, renewable energy, pipelines, cables and flood relief schemes. Lauren has 23 years of experience in water chemistry interpretation, aquatic macroinvertebrate sampling / analysis and is an accredited River Habitat Survey operator (RHS) and Irish River Hydromorphology Assessment Technique (RHAT) surveyor, calculating and interpreting associated metrics and applying these to WFD status classification. She has carried out aquatic sampling and reporting as part of EPA national river monitoring programmes. Her professional and practical skill set in assessing the biological quality elements that underpin ecological status, water quality interpretation and hydromorphology provide a qualified foundation for water body status impact assessment.

3 WATER BODY STATUS IMPACT ASSESSMENTS

3.1 Identification of Directly and Indirectly Affected Water Bodies

The most recently reported EPA waterbody status covers the period 2016-2021. Using EPA maps, **Figure 3-1** shows the location of surface water bodies in relation to the Proposed Scheme. **Figure 3-2** shows the potentially affected groundwater bodies.



Figure 3-1 Location of directly affected EPA river and transitional water bodies (EPA Maps)

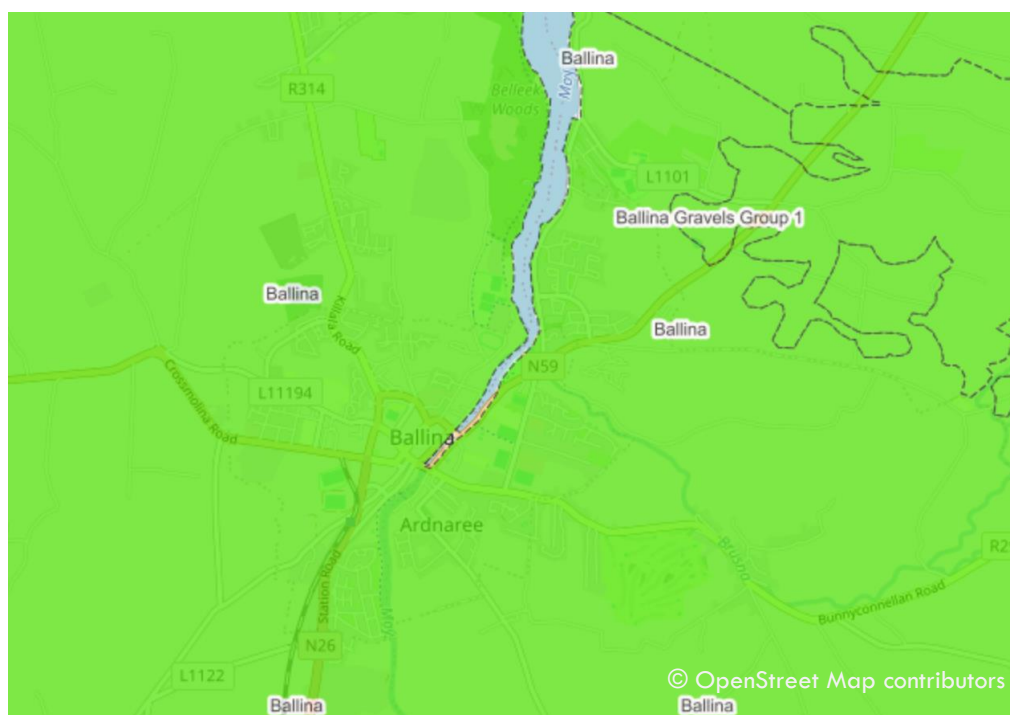


Figure 3-2 Location of EPA groundwater bodies (EPA Maps)

Table 3-1 Directly Affected Water Bodies

EPA Water Body Name [Code] and (Local Name)	Waterbody type	EPA Status Assessment Technique	CURRENT: EPA WB Status (2016-2021)	Status Driver (element limiting status)	WFD Objective Status	EPA assigned Water Body Risk	Listed Pressures (EPA, 2021)
Moy_120 [IE_WE_34M021100] (River Moy)	River	Monitored: Phytobenthos, Invertebrate (Q-value), Fish, GPC, Chemical	Moderate	Q-value (Invertebrate) and Chemical (Benzo(a)pyrene Fail)	Good	At Risk	Hymo, Urban Run-off
Glenree_030 [IE_WE_34G010200] (Brusna River)	River	Monitored: Invertebrate (Q-value), GPC, hymo	Good	Q-value (invertebrate)	Good	Not at Risk	-
Dooyeaghny_or _Cloonloughan_010 IE_WE_34D310990 (Bunree, Quignamanger)	River	Modelling	Good (low confidence)	n/a	Good	Risk under review	-
Tullyegan_010 [IE_WE_34T830920] (Tullyegan)	River	Modelling	Moderate	n/a	Good	Risk under review	-
Moy Estuary [IE_WE_420_0300]	Transitional	Monitored: Phytoplankton, macroalgae, angiosperms, ² Hymo, GPC	Moderate	Macroalgae	Good	At Risk	Agriculture, Domestic and Urban Waste Water
Ballina IE_WE_G_0035	Ground	Monitored	Good	Chemical, Quantitative	Good	Not at Risk	-

² Hymo = Hydromorphology

3.1.1 Directly Affected Water Bodies

MOY_120: Large RWB (33.25 km²) encompassing ~10km of the main channel of the River Moy upstream of Ballina. The Proposed Scheme affects is the tidally influenced, highly modified reach of Ridgepool and Salmon Weir within Ballina. **Table 3-2** sets out the Article 4(7) Applicability Assessment for Moy_120 RWB.

Table 3-2 Article 4(7) Applicability Assessment Moy_120

MOY_120 RWB (Freshwater River Moy at Ridgepool)									
Starting point: EPA assigned status (2016 - 2021) is 'moderate', on the basis of monitored biological elements (fish, phytobenthos, macroinvertebrates) + general physicochemical + chemical status. Chemical status failed in the 2016-2021 RBMP cycle owing to Benzo(a)pyrene failure. The monitoring station is 50m upstream of the Salmon Weir footbridge.									
Modification proposed: New physical modifications are only proposed for Ridgepool and Salmon Weir, located at the very downstream end of the RWB: Refurbishment of existing Ridgepool Quay walls and installation of short sections of new wall along the Ridgepool and Salmon Weir. Fisheries enhancement (approved by IFI) involves minor reshaping of a "groyne" at left-hand side upstream end of Ridgepool to improve salmon holding habitat below the weir, and installation of new access steps at Salmon Weir building.									
Effect of modification (Proposed Scheme): There are no changes to hydrological regime or river continuity as defined by attributes of WFD Annex V. Analysis of hydraulic modelling (Infoworks ICM - 1D in-channel) evaluated in the EIAR (Chapter 9, Section 9.5.4.1) showed very minor changes to Ridgepool instream velocities in the design flood scenarios (50% and 1% AEP). Such small changes to hydraulic conditions within an existing highly modified channel of variable flow / tide combinations means that bed substrate mobilisation, transport and deposition patterns will be subject to imperceptible (if any) change over baseline conditions. Consequently, instream habitats will be subject to imperceptible (if any) morphological modification (as defined by WFD Annex V) in terms of factors that could discernibly affect biological quality elements (BQEs) that define water body status. The Proposed Scheme has either neutral or slightly positive effect on general physico-chemical and chemical status by removal of uncontrolled flood waters through urban Ballina, i.e., reduction in uncontrolled, flood driven pollutant transport to the river channel. RWB status will continue to be driven by catchment pressures upstream of Ballina. Overall water body status will not deteriorate as a result of the Proposed Scheme, and the future attainment of good status is not prevented.									
Quality elements	Biological quality elements (BQEs)			Hydromorphological quality elements supporting the BQEs			GPC	Chemical	Overall ecological status
	Inverts (Q-value)	Phyto benthos	Fish	Hydrology	Morphology	Continuity			
Starting point	M (Q3-4)	H	G	≤M*	≤M*	≤M*	≤M*	Fail	M
Effect owing to modification	M (Q3-4)	H	G	≤M*	≤M*	≤M*	≤M*	Fail	M
Ecological Status Classes - H: High; G: Good; M: Moderate; P: Poor; B: Bad									
* "supporting conditions" are by definition equal to or poorer than highest BQE value									

GLENREE_030: Relatively small RWB (9.22 km²) encompassing ~5km of the Brusna (Glenree) River, adjoining Moy Estuary. The channel was historically highly modified (mill race infrastructure, channelisation, rip-rap bank reinforcement) but has now recovered "natural" instream pool-riffle-glide habitats in the affected reach. **Table 3-3** sets out the Article 4(7) Applicability Assessment for Moy_120 RWB.

Table 3-3 Article 4(7) Applicability Assessment Glenree_030

GLENREE_030 (Brusna River)									
Starting point: EPA assigned status (2016 - 2021) is 'good', on the basis of monitored biological elements (macroinvertebrates) + general physicochemical supporting conditions.									
Modification proposed: Proposed new physical modifications affect a 630m reach of the main channel near Shanaghy Heights Bridge where set-back embankments and flood walls will be installed and bed / bank protection at the bridge will be replaced like-for-like. A low level of riparian tree loss will occur upstream of Shanaghy Heights Bridge in order to construct set-back walls / embankments, but these will be replanted according to mitigations set out in the EIAR (Chapter 9, Section 9.5.2.1).									

Effect of modification (Proposed Scheme): There are no changes to hydrological regime or river continuity as defined by attributes of WFD Annex V. Analysis of hydraulic modelling in the EIAR for the affected reach found no significant changes to instream velocities and Froude number (depth and velocity descriptor) for the design flood scenarios during the operational period (see Chapter 9, Section 9.4.5.3). There will be no change in river continuity or hydrology, i.e., no barrier to fish movement through this RWB into upstream RWBs. With mitigations in place to reinstate any disturbed riparian vegetation as part of the construction phase, there are no long-term significant changes to channel morphology (as defined by attributes in WFD Annex V) that could impinge on biological quality elements (macroinvertebrate Q-value) or supporting physico-chemical elements that define water body status. Good surface water body status will be maintained in line with WFD objectives.						
Quality elements	Biological quality elements (BQEs)	Hydromorphological quality elements supporting the BQEs			GPC	Overall ecological status
	Macroinverts (Q-value)	Hydrology	Morphology	Continuity		
Starting point	G	≤G*	≤G*	≤G*	≤G*	G
Effect owing to modification	G	≤G*	≤G*	≤G*	≤G*	G
Ecological Status Classes - H: High; G: Good; M: Moderate; P: Poor; B: Bad						
* "supporting conditions" are by definition equal to or poorer than highest BQE value						

DOOYEAGHNY_or_CLOONLOUGHAN_010: Moderately large RWB (23.61 km²) encompassing nine (9 no.) small EPA delineated streams that discharge to Moy Estuary, including the Quignamanger and Bunree watercourses affected by the Proposed Scheme. Both watercourses are currently highly modified along their reach, being contained within (currently) undersized culverts through urban Ballina.

EPA assigned "modelled" status (2016-2021) for this RWB as 'good', although on-site Q-values during EIAR field studies of July 2022 represented 'poor' status (Q3) for both Quignamanger and Bunree streams. EPA assigned status is used in the Article 4(7) Applicability Assessment, in line with case law (*Sweetman v An Bord Pleanála [2021] IEHC 16*) which established that EPA assigned status is the only legal baseline against which status assessments can be made. **Table 3-4** sets out the Article 4(7) Applicability Assessment for Dooyeaghny_or_Cloonloughan_010 RWB.

Table 3-4 Article 4(7) Applicability Assessment Dooyeaghny_or_Cloonloughan_010

DOOYEAGHNY_or_CLOONLOUGHAN_010 (Bunree and Quignamanger Streams)
Starting point: EPA assigned status (2016 - 2021) is 'good', on the basis of "modelling".
Modification proposed: <i>Quignamanger:</i> Replacement of a diversion culvert along Creggs Road, upgrade of the existing culvert under Quay road with associated channel reinstatement and removal of an existing culvert flap-valve. <i>Bunree:</i> Upgrade existing culverts to remove constrictions, installation of short sections of new culvert upstream of N59 and removal of a 65m section of existing culvert downstream of the N59 to create open channel.

DOOYEAGHNY or CLOONLOUGHAN_010 (Bunree and Quignamanger Streams)						
<p>Effect of modification (Proposed Scheme): <i>Quignamanger:</i> Culvert upgrade effects were examined in the EIAR in terms of effects on potential biological quality elements (fish, invertebrates) and groundwater dependent habitat (tufa deposits) (Chapter 9, Section 9.4.5.2 and Chapter 11, Section 11.4.2.10), showing a likelihood of positive hydromorphological effects in the long-term owing to increased river continuity (greater fish passage potential), improved morphology (open reach at Moy confluence) and no significant effect on hydrological regime. The modifications do not impact on existing tufa spring habitat nor alter the supply of calcium rich streamwater (from springs located well upstream). Potentially adverse morphological changes related to increased channel gradient into the Quay Rd culvert are mitigated by design (short section of step-pool rock ramp) which will be passable by fish and will likely facilitate tufa deposition (turbulence). <i>Bunree:</i> Culvert upgrade effects were examined in the EIAR in terms of effects on potential biological quality elements (noting the stream has low baseline ecological value) (Chapter 9, Section 9.4.5.3), showing a likelihood of positive hydromorphological effects in the long-term owing to increased river continuity (greater fish passage potential), improved hydrology and morphology owing to removal of a flow constriction and restoration of a reach of open channel.</p> <p><i>Combined effect on RWB:</i> There are either no changes or slightly positive effects on overall hydrological regime (owing to flow constriction removals). There are potentially positive effects on river continuity (increased fish passage potential) as defined by attributes of WFD Annex V. Analysis of hydraulic modelling in the EIAR showed moderately increased channel velocities under the design flood scenarios compared to baseline (50% and 1%) at locations on both streams, but this is related to removal of flow constrictions arising from existing undersized culverts and restoration of open channel reaches, which represents an improvement in channel morphology in the long-term in these highly modified channels. With mitigations in place there are no long-term significant effects on RWB morphology (as defined by attributes in WFD Annex V) that could impinge on potential biological quality elements (macroinvertebrate Q-value) or supporting physico-chemical elements that define water body status. Good surface water body status will be maintained in line with WFD objectives.</p>						
Quality elements	Biological quality elements (BQEs)	Hydromorphological quality elements supporting the BQEs			GPC	Overall ecological status
	Modelled BQE	Hydrology	Morphology	Continuity		
Starting point	G	≤G*	≤G*	≤G*	≤G*	G
Effect owing to modification	G	↑≤G**	↑≤G**	↑≤G**	≤G*	G
Ecological Status Classes - H: High; G: Good; M: Moderate; P: Poor; B: Bad						
<i>* "supporting conditions" are by definition equal to or poorer than highest BQE value</i>						
<i>** ↑ improvement over existing conditions is likely, still "supporting" the BQE value</i>						

TULLYEGAN_010: Relatively small RWB (12.23 km²) encompassing the Tullyegan stream and its small tributaries which adjoins the River Moy upstream of Ballina. The Tullyegan is highly modified throughout by arterial drainage and is already deepened and walled in the lower reaches that will be affected by the Proposed Scheme. sets out the Article 4(7) Applicability Assessment for Tullyegan_010 RWB. **Table 3-5** sets out the Article 4(7) Applicability Assessment for Tullyegan_010 RWB.

Table 3-5 Article 4(7) Applicability Assessment Tullyegan_010

TULLYEGAN_010 (Tullyegan Stream)
<p>Starting point: EPA assigned status (2016 - 2021) is 'moderate', on the basis of modelling.</p>
<p>Modification proposed: New physical modifications consist of a combination of flood wall and embankment proposed along a 150m reach between the N59 and the railway.</p>

TULLYEGAN_010 (Tullyegan Stream)						
<p>Effect of modification (Proposed Scheme): Analysis of hydraulic modelling in the EIAR for the affected reach found that although there were slight increases in downstream in-channel velocities for the design flood scenarios (50% and 1% AEP) during the operational period (see Chapter 9, Section 9.4.5.3), there are no ecologically critical changes that could have a significant effect on biological quality elements that would define water body status (if the RWB was monitored). Given the relatively low existing in-channel velocities, the post-scheme scenarios may even be positive for macroinvertebrates and fish in terms of flushing out sediment fine sediment and improving substrate condition for macroinvertebrates and trout in this currently drained channel. There will be no change in hydrological regime as defined by WFD Annex V or river continuity or, i.e., no introduction of barriers to potential fish movement throughout this RWB from the River Moy. There are predicted to be a combination of imperceptible negative and slightly positive effects on RWB morphology (as defined by attributes in WFD Annex V) that will not impinge on potential biological quality elements (macroinvertebrate Q-value) or supporting physico-chemical elements that define water body status. Overall ecological status will not deteriorate, and the future attainment of good status is not prevented.</p>						
Quality elements	Biological quality elements (BQEs)	Hydromorphological quality elements supporting the BQEs			GPC	Overall ecological status
	Macroinverts (Q-value)	Hydrology	Morphology	Continuity		
Starting point	M	≤M*	≤M*	≤M*	≤M*	M
Effect owing to modification	M	≤M*	↑≤M*	≤M*	≤M*	M
<p>Ecological Status Classes - H: High; G: Good; M: Moderate; P: Poor; B: Bad</p>						
<p>* "supporting conditions" are by definition equal to, or poorer than, highest BQE value</p>						

MOY ESTUARY: Large transitional water body covering >10km of the tidal River Moy stretching from the Upper Bridge in Ballina to Killala Bay. sets out the Article 4(7) Applicability Assessment for Moy Estuary transitional water body. **Table 3-6** sets out the Article 4(7) Applicability Assessment for Moy Estuary transitional water body.

Table 3-6 Article 4(7) Applicability Assessment Moy Estuary

MOY ESTUARY (Transitional Water Body)
<p>Starting point: EPA assigned status (2016-2021) is 'moderate', based on monitored biological elements (macroalgae, phytoplankton, fish) plus supporting general physicochemical elements.</p>
<p>Modification proposed: Upgrade and installation of set-back flood defence walls downstream covering up to 400m downstream of N59 Lower Bridge. This is largely refurbishment and increasing height of existing river walls. There are no instream physical modifications in the Cathedral Pool – all works are bankside and do not alter river morphology (e.g., railings on Emmett Street become walls, plus out-of-channel works in association with the future new public realm along Cathedral Road to achieve the design standard.</p>
<p>Effect of modification (Proposed Scheme): There are no changes to riverine estuary tidal regime as defined by attributes in WFD Annex V (freshwater flow, wave exposure). Reed swamp berms and existing boulder riprap on both banks downstream of the N59 Lower Bridge will be reinstated as part of construction meaning there will be no residual changes to morphology in terms of structure of the riparian, intertidal zone or in-channel substrates. Hydraulic modelling shows imperceptible alterations to depth variation and water velocity during 50%AEP and 1%AEP design scenarios in the 500m reach downstream of the N59 Lower Bridge (see Chapter 9, Appendix 9.8), hence there will be no perceivable adverse effect on structure or substrate of the estuarine river bed that could alter biological quality elements that define status. Instream habitats will therefore be subject to imperceptible (if any) morphological modification (as defined by WFD Annex V) in terms of factors that could discernibly affect biological quality elements (BQEs) that define water body status. Also noted is that the driver of less-than-good status in this water body is the macroalgae BQE, which is largely influenced by nutrient and not morphological conditions. In this regard, the Proposed Scheme has either a neutral or slightly positive effect on general physico-chemical elements by removal of uncontrolled flood waters through urban Ballina, i.e., reduction in flood driven pollutant transport to the river channel, including nutrient from stormwater and urban run-off. This could assist in improving the macroalgal BQE classification. Overall ecological status will not deteriorate, and the future attainment of good status is not prevented.</p>

MOY ESTUARY (Transitional Water Body)							
Quality elements	Biological quality elements (BQEs)					GPC	Overall ecological status
	Macroalgae	Phyto plankton	Angiosperm	Morphology	Tidal Regime		
Starting point	M	G	G	≤M*	≤M*	≤M*	M
Effect owing to modification	M	G	G	≤M*	≤M*	↑≤M**	M
Ecological Status Classes - H: High; G: Good; M: Moderate; P: Poor; B: Bad							
* "supporting conditions" are by definition equal to, or poorer than, highest BQE value							

Ballina GWB: Large, regionally important limestone aquifer underlying the Proposed Scheme. Ballina Gravels Group 1 GWB is associated with this waterbody but is >800m upstream of the Proposed Scheme footprint on the Quignamanger stream and is not directly or indirectly affected. **Table 3-7** sets out the Article 4(7) Applicability Assessment for Ballina GWB.

Table 3-7 Article 4(7) Applicability Assessment Ballina GWB

GWB: Ballina			
Starting point: Overall groundwater quantitative status is classified as "good" since each criterion meets the conditions for "good"			
Effect of Proposed Scheme: As set out in the EIAR (Chapter 11, Section 11.4.2) there is minimal (relatively shallow) excavation into the limestone rock proposed and no groundwater wells in the vicinity of the proposed works with no mapped karst features or evidence of karstification found during field studies or SI works, with no significant negative effects predicted on the underlying aquifer. The source area for the Quignamanger stream GWDTE (tufa springs) is not affected by the Proposed Scheme, i.e., the spring risings that give rise to tufa deposits along the Quignamanger are well upstream of proposed culvert works. No interference with GW flow in the Ballina GWB will occur and no abstraction occurs. The physical modifications under the Proposed Scheme do not alter groundwater levels and therefore do not impinge on groundwater level and linked quantitative attributes. With mitigations implemented as prescribed in the EIAR in the area of surface water quality protection (Chapter 12, Section 12.5), there will be no infiltration of construction phase pollutants that could adversely affect groundwater chemical status. Given the small, discrete areal extents of the Proposed Scheme footprints there will be no operational phase changes to overlying surface water quantity or quality (i.e., potential groundwater recharge) associated with the project. The residual effect on quantitative and chemical status of the Ballina GWB will be neutral. 'Good' GWB quantitative status will be maintained in line with WFD objectives.			
		Starting point	Effect of modification
Quantitative Criteria	1) Available GW resource is not exceeded by the long term annual average rate of abstraction	G	G
	2) No significant diminution of surface water chemistry and/or ecology resulting from anthropogenic water level alteration or change in flow conditions that would lead to failure of Article 4 objectives for any associated surface water bodies?	G	G
	3) No significant damage to GW dependent terrestrial ecosystems resulting from an anthropogenic water level alteration;	G	G
	4) No saline or other intrusions resulting from anthropogenically induced sustained changes in flow direction.	G	G
Overall groundwater status		G	G
WFD GWB Status Classes - G: Good; P: Poor			

3.1.2 Indirectly Affected Water Bodies

Hydrologically connected water bodies upstream of Ballina, within the Moy and Brusna (Glenree) water catchments, could be affected indirectly by the Proposed Scheme if there was cause for deterioration in their quality elements (and hence ecological status), or if achievement of at least 'good' status was prevented in those connected water bodies. In the case of upstream water bodies of the Moy and Brusna (Glenree), only the 'river continuity' sub-element of hydromorphology has any potential to cause deterioration in status, i.e., if the modifications near Ballina to discrete reaches of the Moy_120 and Glenree_030 introduced new fish passage barriers.

However, the Proposed Scheme does not introduce any new barriers to fish movement, nor does it significantly adversely affect the morphological condition or hydrology sub-elements for these upstream water bodies. For that reason, all connected upstream waterbodies are scoped out of this assessment as there is no risk that their status could deteriorate or be prevented from achieved good (or high) status because of the Proposed Scheme.

Downstream of the Moy Estuary transitional water is the Killala Bay coastal water body (IE_WE_420_0000), classified by the EPA as 'good' status and 'not at risk' (2016-2021) based on biological quality (invertebrates) and supporting general physico-chemical (GPC) elements. This coastal water body is ~10km downstream of Ballina and 7.7km downstream of the Quignamanger confluence. At the separation distance involved and considering the relatively small scale of new modifications on discrete reaches of water bodies well upstream in the vicinity of Ballina, there will be a neutral effect on morphological attributes or tidal regime (see defining attributes in Section 2.2.4, above) of Killala Bay at the water body scale. With the implementation of mitigations around water quality protection (Chapter 9, Section 9.5, Chapter 12, Section 12.5), residual effects on water quality will also be neutral in Killala Bay. Hence the Proposed Scheme does not give cause for deterioration in the biological quality elements that currently determine good status in the downstream Killala Bay coastal water body. Good status can be maintained in line with WFD objectives.

3.2 Article 4(7) Applicability Assessment Summary

Table 3-8 Summary of WFD Compliance Tests

Water body	Water body type	Deterioration of status?	Prevention of good status?	Does the proposed scheme ensure compliance with WFD Article 4(1) objectives for this water body?
Moy_120 IE_WE_34M021100	River	No	No	Yes
Glenree_030 IE_WE_34G010200	River	No	No	Yes
Dooyeaghghny_or _Cloonloughan_010 IE_WE_34D310990	River	No	No	Yes
Tullyegan_010 IE_WE_34T830920	River	No	No	Yes
Moy Estuary IE_WE_420_0300	Transitional	No	No	Yes
Ballina IE_WE_G_0035	Groundwater	No	No	Yes
Killala Bay IE_WE_420_0000	Coastal	No	No	Yes
OVERALL WFD ASSESSMENT RECOMMENDATION		The project can be authorized under the WFD as it does not compromise Article 4(1) objectives.		

4 CONCLUSION

The Proposed Scheme, by design and with mitigations implemented as prescribed in EIAR Chapters 9, 11 and 12 (amalgamated in the CEMP), will not cause deterioration of status in any water body at individual quality element level nor will it compromise improvement to good status where necessary. This document in conjunction with detailed information within the EIAR provides evidence to support the conclusion. The Proposed Scheme is compliant with WFD Article 4(1) objectives, does not require Article 4(7) derogation, and can therefore be authorised under the WFD.

5 REFERENCES

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EC (2009) CIS Guidance No. 18. WFD Common Implementation Strategy. Guidance on Groundwater Status and Trend Assessment.

EC (2017) CIS Guidance No. 36. Water Framework Directive Common Implementation Strategy. Exemptions to the Environmental Objectives according to Article 4(7) New modifications to the physical characteristics of surface water bodies, alterations to the level of groundwater, or new sustainable human development activities.

EPA (2021) 3rd Cycle Draft Moy & Killala Bay Catchment Report (HA 34). V1. Catchment Science & Management Unit Environmental Protection Agency. Ireland.