

# Jacobs

## Cork Line Level Crossings

Volume 5, Appendix 9B WFD Assessment

Iarnród Eireann

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## Appendix 9B: Water Framework Directive (WFD) Assessment

### 9B.1 Introduction

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (the Water Framework Directive (WFD)) was adopted and came into force in 2000 and represents a culmination in European Union (EU) water resource protection. It establishes a legislative framework for the protection of surface waters (including rivers, lakes, transitional waters and coastal waters) and groundwater throughout the EU. The WFD was transposed into law in Ireland through the S.I. 722/2003 European Union (Water Policy) Regulations 2003 (WFD Regulations).

The 2004 Regulations place a general duty on a public authority to:

- *"exercise its functions in a manner which is consistent with the provisions of the Directive and which achieves or promotes compliance with the requirements of the Directive". And*
- *"take such actions as may be appropriate in the context of its functions to secure compliance with the Directive and with the provisions of any river basin management plan made, and any programme of measures established, in accordance with these Regulations;"*

This applies to all decisions made by public authorities, including planning authorities and decisions relating to planning consents, including Railway Orders.

This report forms part of the application for a Railway Order for the proposed elimination/upgrade seven public road level crossings on the Dublin-Cork Railway Line (hereafter referred to as the proposed Project). It provides supporting information to enable the Competent Authority (An Bord Pleanála) to ensure any approvals are in accordance with their duties under the WFD Regulations.

The primary aim of the WFD is to improve/maintain the overall Status/Potential of all WFD water bodies. The overall Status/Potential comprises a series of biological, physico-chemical and hydromorphological quality elements for surface waters, and, quantitative and qualitative quality elements for groundwaters.

The purpose of this WFD Assessment is to support the Environmental Impact Assessment Report (EIAR) and provide an assessment of the potential impacts of the proposed Project on the surrounding WFD water bodies. It is intended to be read alongside, and to support, the main Environmental Impact Assessment Report (EIAR) for the proposed Project, in particular Volume 3, Chapter 9: Water which addresses the proposed Project's potential effects on the surface water environment.

### 9B.2 Legislative and Policy Background

Volume 2, Chapter 4: EIA Process and Methodology sets out the overarching legislation that is applicable to the proposed Project. The WFD Regulations set out the process for determining the water protection and water management measures required in Ireland to achieve the WFD Directive's objectives:

- to prevent deterioration in status of water bodies;
- to achieve at least Good Ecological Status (GES) and Good surface water chemical status in water bodies by 2015;
- to achieve Good Ecological Potential (GEP) by 2015 for A/HMWB;
- to comply with objectives and standards for protected areas where relevant; and,
- to reduce pollution from priority substances and cease discharges, emissions and losses of priority hazardous substances.

The River Basin Management Plan (RBMP) sets what is known as the '*reference condition*' for any given water body. These reference conditions are type-specific, and vary between different types of rivers, lakes and coastal waters, accounting for the broad diversity of ecological regions in Europe.

Assessment of quality is based on the extent of deviation from these reference conditions, following the definitions in the Directive. Good status means there is a '*slight*' deviation from the reference conditions; Moderate Status means there is a greater deviation from the reference conditions, and so on. For some WFD water bodies, the WFD status is set as '*unassigned*'. This is usually concluded where there is low confidence in the biological, physico-chemical and hydromorphological quality elements due to a lack of data, or, because a status has yet to be agreed.

The Environmental Protection Agency (EPA) is responsible for monitoring the WFD status of the WFD water bodies. In this cycle of the RBMP, Cycle 2, characterisation of the WFD water bodies has gone beyond the classification of status. The EPA also assesses whether a WFD water body is '*At Risk*' of meeting its WFD objectives (i.e. good or High Status/potential). This assessment reviews information on matters such as current water quality trends and catchment pressures. Currently 2,113 WFD water bodies are classified as '*Not At Risk*' and 1,460 are classified as '*At Risk*', with the remainder (1,256) requiring further investigation.

The introduction of a new modification, a change in activity or an existing structure on a WFD water body needs to be considered as to whether it could:

- cause a deterioration in the overall status or potential;
- result in any of the proposed mitigation measures or actions assigned under the WFD from being implemented, effecting the achievement of good status/potential; and/or,
- render existing mitigation measures or actions ineffective, resulting in the WFD water body from failing to achieve good status/potential.

Where a project is considered to cause a deterioration or could contribute to the failure of the WFD water body from achieving good status or potential, then, for the project to proceed, an Article 4(7) assessment would be required. Article 4(7) is an exemption that applies where a new modification would lead to the failure to achieve one or more of the WFD objectives.

### **9B.3 Study Area**

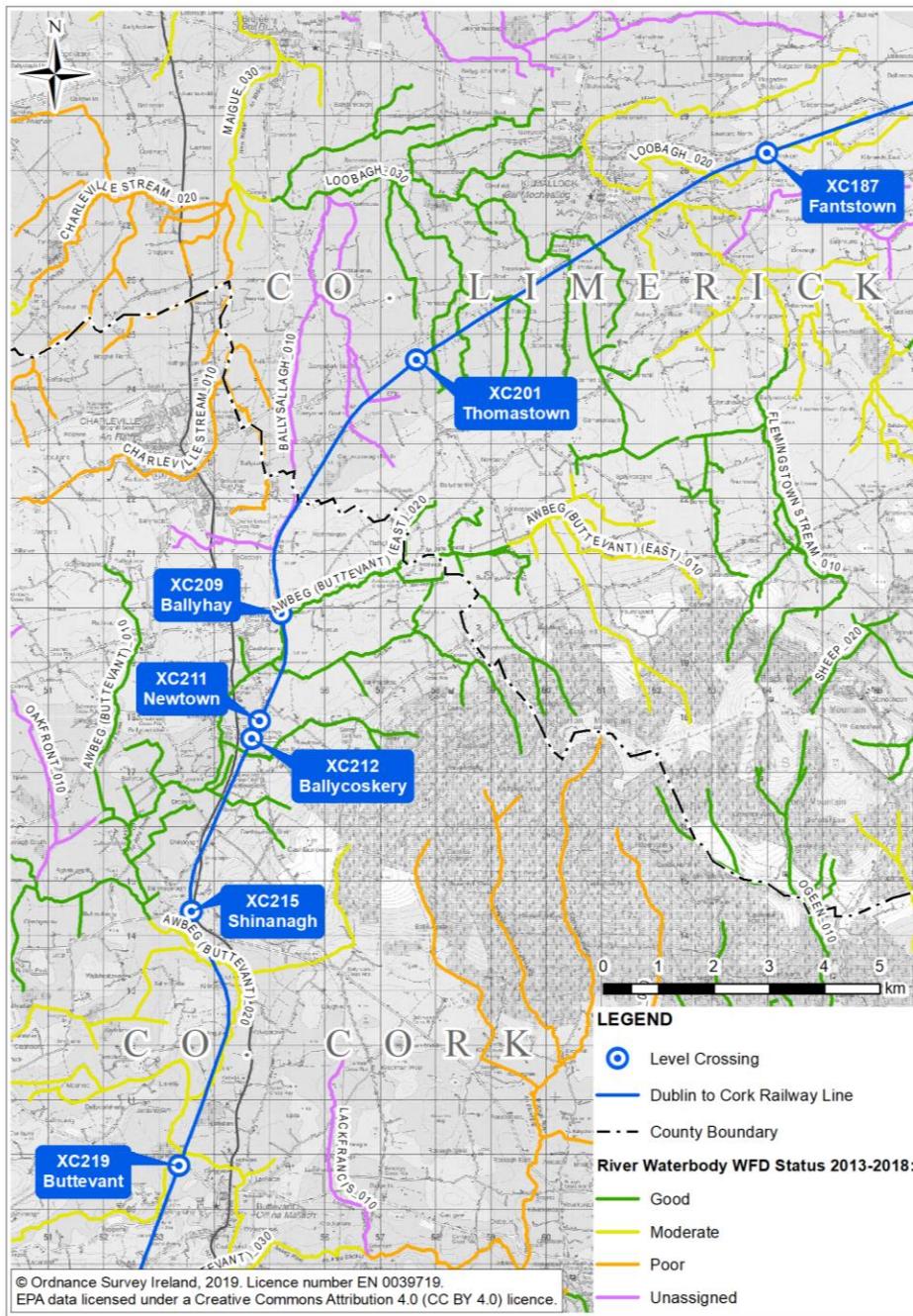
For the purposes of the WFD Assessment, the study area is determined by the surface and ground water bodies present in the vicinity of the proposed Project and which may be impacted upon. The study areas for the biodiversity (Volume 3, Chapter 7), soils, geology and hydrogeology (Volume 3, Chapter 8) and water (Volume 3, Chapter 9) assessments are therefore used in this assessment.

For the most part, the immediate receptors for the proposed Project are small drainage ditches and channels which feed into larger water bodies. These immediate downstream water bodies are included; however, waterbodies beyond those to which the lesser stream feeds into are not included unless they have been designated as a Special Area of Conservation (SAC), and would therefore come within the study area for the Biodiversity assessment.

The seven sites are within a 24km stretch of the Dublin-Cork Railway Line; from the northernmost point, Level Crossing XC187 at Fantstown to Level Crossing XC219 at Buttevant. The nearest urban areas to the sites are Kilmallock in the north which lies approximately 2km west of XC187 Fantstown, Charleville which lies approximately 2km north west of XC209 Ballyhay and Buttevant in the south which lies approximately 0.9km south east of XC219 Buttevant.

The sites fall within two hydrological catchments; the Shannon South Estuary in Limerick flowing generally north and west; and the Blackwater (Munster) in Cork, flowing generally south (see Inset Figure 9B.1 for water bodies).

Inset Figure 9B.1 WFD Water Bodies in the Study Area



## 9B.4 Methodology

In the absence of guidance on WFD Assessments in Ireland, the assessment approach was informed by the UK Planning Inspectorate Advice Note 18: Water Framework Directive (Planning Inspectorate, 2017). The assessment was based on a combination of desk study and a site walkover information. The following steps were undertaken:

- collation and review of baseline desk-based information on the proposed Project and WFD water bodies within the study area; and
- assessment of the likely impacts of the proposed Project on the WFD water bodies.

#### **9B.4.1 Desk Study**

A desk-based study was carried out reviewing existing information on the Proposed Project to develop a baseline for the catchments and adjacent areas. The following key data sources were reviewed for the desk study:

- Designated areas (National Parks and Wildlife Service, 2018);
- Interactive Flood Risk Mapping (OPW, 2018);
- River Basin Management Plan for Ireland 2018 – 2021 (Government of Ireland, 2018);
- Environmental Protection Agency (EPA) website (EPA, 2018); and
- Eden WFD Portal.

#### **9B.4.2 WFD Assessment Stages**

A sequence for undertaking an assessment of the compliance under the WFD has been developed in line with the available guidance. Taking this into account the report structure is summarised below:

- **Stage 1:** WFD screening to determine if there are any activities associated with the proposed Project that do not require further consideration, for example activities which are ongoing or form maintenance activities;
- **Stage 2:** Scoping identifies the receptors and water body elements that are potentially at risk from the Project and need impact assessment); and
- **Stage 3:** WFD Impact Assessment considers the potential impacts of the Project, identifies ways to avoid or minimise impacts, and indicates if the Project may cause deterioration or jeopardise the water body achieving GES or GEP.

#### **9B.5 Stage 1: Screening**

Details of the proposed Project are provided in Volume 3, Chapter 3: Project Description. A summary of the main elements is provided in Table 9B.1

Table 9B.1 Proposed Solutions at Each Crossing

Location	Infrastructure	Description
XC187 Fantstown	N/A	Straight Closure: Alternative route along existing roads to existing road-over-rail bridge approximately 3km to the north east.
XC201 Thomastown	1no. road-over-rail bridge.	New road-over-rail bridge: Tie in to existing local road to south and new junction on Regional Road R515 to north.  Carriageway widths are proposed to match existing widths for safety reasons. Following consultation with Limerick City and County Council Roads Department as well as submissions made by members of the public, the structure has been widened so that minimal works would be required to accommodate a future widened carriageway.
XC209 Ballyhay	CCTV solution	Replace the existing manned level crossing with a remote monitored CCTV solution.

Location	Infrastructure	Description
XC211 Newtown	New access road.	<p>New Access Road: Immediately east of the existing road-over-rail bridge to the north of XC211 Newton; tie in to existing Local road to the east of XC211 Newtown. Carriageway widths are proposed to match existing widths for safety reasons, with passing bays located in accordance with TII standards.</p> <p>This alignment was chosen following public consultation and concerns raised about the initial proposal for a new access road tie in from the rear of the Beechwood Grove housing estate to the local road west of the XC211 Newtown level crossing.</p>
XC212 Ballycoskery	1 no. road-over-rail bridge, 2no. retaining walls.	New road-over-rail-bridge: Tie in to existing Local Road to East and West, new carpark proposed for existing school. Tie into Beechwood Housing Estate and Ballyhea National School to North and existing Local road to south.
XC215 Shinanagh	<p>Tie into existing road-over-rail bridge.</p> <p>Upgrade of existing junction on N20, closure of existing N20 junction at current level crossing location.</p> <p>Resurfacing of section of existing local road.</p>	New access road to tie into existing road-over-rail bridge approximately 1km to the north.
XC219 Buttevant	1no. road-over-rail bridge, 1no. portal frame road-over-river bridge culvert, 1no. ditch box culvert, 1no.access road box culvert, 2no. retaining walls.	New road-over-rail bridge. Tie in to existing regional road to east and west.

None of the elements proposed are ongoing or form maintenance activities and therefore do not form part of the baseline. As a result, all elements of the proposed Project are screened IN for potential impacts on WFD objectives.

## 9B.6 Stage 2: Scoping

### 9B.6.1 Scoping WFD Quality Elements

Based on an understanding of the Proposed Project, the following WFD quality elements have been screened in at this stage for fluvial and groundwater WFD water bodies:

- Fluvial:
  - Biological: fish, invertebrates, aquatic flora;
  - Physico-chemical: thermal conditions, oxygenation conditions, salinity, acidification status (pH), nutrient conditions, specific pollutants; and,
  - Hydromorphological: quantity and dynamics of flow, connection to groundwater, river continuity, river depth and width variation, structure and substrate of the riverbed and structure of the riparian zone.
- Groundwater:
  - Quantitative: saline intrusion; impact of groundwater on surface water (ecological/chemical); Groundwater Dependent Ecosystems; quantitative assessment test; and, water balance; and,

- Chemical: saline intrusion; impact of groundwater on surface water (ecological/chemical); Groundwater Dependent Ecosystems; chemical assessment test; drinking water protected area; general chemical assessment test.

Fluvial and groundwater bodies are considered further to determine the potential for impacts upon them.

Water bodies that have been identified within the study areas of each of the seven sites, are summarised in Volume 3, Chapter 9 Water. Details of these, their quality elements and the potential for the proposed Project to impact upon these is provided in Table 9B.2 and Table 9B.3.

Table 9B.2 Scoping of Surface Water Body WFD Quality Elements

Level Crossing	Water Bodies	Overall WFD Status	Quality Elements	Scoped In or Out	Reasoning
XC187	Loobagh_020	Moderate	Biological	OUT	No construction works are proposed for this site apart from the stopping up of the existing level crossing. No impacts are possible.
			Physico-chemical	OUT	
			Hydromorphological	OUT	
	Fairyfield Glebe_010	Unassigned	Biological	OUT	No construction works are proposed for this site apart from the stopping up of the existing level crossing. No impacts are possible.
			Physico-chemical	OUT	
			Hydromorphological	OUT	
XC201	Loobagh_030	Good	Biological	IN	Construction phase impacts on water quality, secondary impacts on biological quality elements. Operational phase, new impermeable area with increased pollution loading.
			Physico-chemical	IN	Construction phase impacts on water quality. Operational phase, new impermeable area with increased pollution loading.
			Hydromorphological	IN	Construction phase impacts on water quality, increased sediment load, altering water body bed substrate Operational phase, new impermeable area with increased pollution loading.
	Ballysalagh_010	Unassigned	Biological	OUT	No likely hydrological connection from proposed Project.
			Physico-chemical	OUT	
			Hydromorphological	OUT	
XC209	Awbeg (Buttevant) (East)_020	Good	Biological	IN	Construction works to upgrade to CCTV potential impacts on water quality, secondary impacts on biological quality elements, immediately upstream of Blackwater River (Cork/Waterford) SAC. No operational impacts.
			Physico-chemical	IN	Construction works to upgrade to CCTV potential impacts on water quality. No operational impacts.
			Hydromorphological	IN	Construction phase impacts on water quality, increased sediment load, altering water body bed substrate. No operational impacts.
XC211		Good	Biological	IN	Potential construction impacts as a result of water quality impacts but limited.

Level Crossing	Water Bodies	Overall WFD Status	Quality Elements	Scoped In or Out	Reasoning
	Awbeg (Buttevant) (East)_020		Physico-chemical	IN	Potential construction impacts, but limited Operational phase, new impermeable area with increased pollution loading.
			Hydromorphological	OUT	No potential impact
XC212	Awbeg (Buttevant) (East)_020	Good	Biological	IN	Construction phase impacts on water quality, secondary impacts on biological quality elements; in-stream working for installation of culvert, possible impacts on SAC.  Operational phase, new impermeable area with increased pollution loading.
			Physico-chemical	IN	Construction phase impacts on water quality.  Operational phase, new impermeable area with increased pollution loading.
			Hydromorphological	IN	Construction phase impacts on water quality, increased sediment load, altering water body bed substrate. New culvert, altering ditch structure.  Operational phase, new impermeable area with increased pollution loading.
XC215	Awbeg (Buttevant) (East)_010	Good	Biological	IN	Construction phase impacts on water quality, secondary impacts on biological quality elements.  Operational phase, new impermeable area with increased pollution loading.
			Physico-chemical	IN	Construction phase impacts on water quality.  Operational phase, new impermeable area with increased pollution loading.
			Hydromorphological	IN	Construction phase impacts on water quality, increased sediment load, altering water body bed substrate.  Operational phase, new impermeable area with increased pollution loading.
XC219	Awbeg (Buttevant) (East)_020	Good	Biological	IN	Construction phase impacts on water quality, secondary impacts on biological quality elements; in-stream working for installation of culverts, possible impacts on SAC.  Operational phase, new impermeable area with increased pollution loading.
			Physico-chemical	IN	Construction phase impacts on water quality  Operational phase, new impermeable area with increased pollution loading.
			Hydromorphological	IN	Construction phase impacts on water quality, increased sediment load, altering water body bed substrate. New culvert, altering ditch structure.  Operational phase, new impermeable area with increased pollution loading.

Table 9B.3 Scoping of Ground Water Body WFD Quality Elements

Level Crossing	Water Bodies	Quality Elements	Overall WFD Status	Scoped In or Out	Reasoning
XC187	Charleville	Chemical	Good	OUT	No significant construction activities. No impacts possible. No operational impacts possible.
		Quantity	Good	OUT	No significant construction activities. No impacts possible. No operational impacts possible.
XC201	Charleville	Chemical	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
XC209	Newtown Ballyhay	Chemical	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
XC211	Newtown Ballyhay	Chemical	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
XC212	Newtown Ballyhay	Chemical	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
XC215	Ballyhoura Kiltorcan	Chemical	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
	Mitchelstown	Chemical	Poor	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.
XC219	Mitchelstown	Chemical	Poor	IN	Potential disturbance to flows; potential connection to groundwater during construction.
		Quantity	Good	IN	Potential disturbance to flows; potential connection to groundwater during construction.

### 9B.6.2 Baseline Conditions

More detailed baseline conditions for the scoped-in waterbodies for each of the seven sites are presented in Table 9B.4 and Table 9B.5 including whether the water bodies are 'At Risk' and what pressures are present with the water body catchments.

Table 9B.4 Surface Water Body Baseline

Water Bodies	WFD Status	Designations	At Risk?	Pressures
Loobagh_030	Good	None	Under review – possible risks from tributaries	Nutrient and organic pollution, mostly runoff from pasture; some wastewater and septic tank pressures also.

Water Bodies	WFD Status	Designations	At Risk?	Pressures
<b>Awbeg (Buttevant) (East)_010</b>	Good	Hydrological connection to Blackwater River (Cork/Waterford) SAC	At Risk	Hydromorphology: siltation, channel modifications. Agriculture: evidence of nutrient enrichment (filamentous algae), nutrient and organic pollution.
<b>Awbeg (Buttevant) (East)_020</b>	Good	Hydrological connection to Blackwater River (Cork/Waterford) SAC	At Risk	Ecological status poor. Urban wastewater: pressures from Combined Sewer Overflows. Agriculture: pasture a potential pressure. Urban run-off: diffuse sources including misconnections (wastewater from homes connected to surface water drains instead of wastewater drains).

Table 9B.5: Ground Water Body baseline

Water bodies	Quality Elements	WFD Status	At Risk?	Pressures
Charleville	Chemical	Good	Under review	Not at risk for nitrate; under review for ortho-phosphate (as phosphate (P)); Agriculture: contributing phosphate to surface water bodies (although these are outside of study area).
	Quantity	Good	Not at risk	No pressures identified.
Newtown Ballyhay	Chemical	Good	Not at risk	No pressures identified.
	Quantity	Good	Not at risk	No pressures identified.
Ballyhoura Kiltorcan	Chemical	Good	At risk	Under review for nitrate and orthophosphate. Agriculture and Forestry: contributing phosphate to surface water bodies including Awbeg (Buttevant) (East)_010 and Awbeg (Buttevant) (East)_020.
	Quantity	Good	Not at risk	No pressures identified
Mitchelstown	Chemical	Poor	At risk	At risk specifically for orthophosphate; under review for nitrate. Agriculture and forestry: contributing phosphate to surface water bodies including Awbeg (Buttevant) (East)_010 and Awbeg (Buttevant) (East)_020. Nitrate exceed drinking water standard.
	Quantity	Good	Not at risk	No pressures identified.

## 9B.7 Stage 3: Predicted Impacts

Mitigation measures for these are provided in the mitigation section of Volume 3, Chapter 9: Water.

### 9B.7.1 Water Body Specific Impacts

The potential for these and site-specific construction impacts, and operational impacts to affect the ability of scoped-in water bodies to meet their objectives is assessed for each site in Table 9B.6 to Table 9B.11. Assessment of biological impacts is drawn from Volume 3, Chapter 9: Water.

**XC201 Thomastown**

Table 9B.6 Potential Effects on Waterbodies at XC201

Quality Element	Construction	Operation		
	New Bridge	Compound		
<b>Surface Water Bodies: Loobagh_030</b>				
<b>Biological</b>				
Composition and abundance of aquatic flora.	Potential smothering of substrate flora by sediment. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Potential secondary impact on ditch ecosystem, passed to water body from spillage of any noxious substance. With implementation of mitigation, no risk of deterioration or not meeting objectives	Swales provide treatment for water quality. No risk of deterioration or not meeting objectives	Small amount of habitat loss in ditch as culverted at bridge tie-in to regional road. Low value. No risk of deterioration or not meeting objectives.
Composition and abundance of aquatic fauna.	Potential for disturbance of invertebrates and fish. With implementation of mitigation, no risk of deterioration or not meeting objectives			
<b>Physico-chemical</b>				
Oxygenation, acidification and nutrient conditions.	Concrete washings could contribute to increased acidification. With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact likely	No impact	No impact
Sediment. Load in water body	Working in and near the ditch heightens the risks of sediment input. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential silty water runoff from stripped soil. Compound will be laid with gravel. With implementation of mitigation, no risk of deterioration or not meeting objectives	Increased pollution loads due to an increased impermeable area could result in increased input of sediment to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives	No impact
Noxious substances.	Working near the ditch heightens the risks of hazardous material spillages. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential for oil and chemical spills from material stored at the compound. With implementation of mitigation, no risk of deterioration or not meeting objectives	Increased pollution loads due to an increased impermeable area could result in increased input of hydrocarbons and metals to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives	No impact
<b>Hydromorphology</b>				

Quality Element	Construction	Operation	
Quantity and dynamics of water flow.	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	The design of the drainage system means that there will be no net increase in runoff. No changes to established field drains. Installation of pipe culvert for ditch crossing at tie-in.
Connection to groundwater bodies.	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and not significant at a WFD water body scale.	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	No impact  Reduced connectivity at culvert but short (less than 10m). No significant impact.
River depth and width variation.	No impact	No impact	No impact  Culvert will alter ditch dimensions but will be large enough to ensure adequate flow. No alterations proposed to rh Loobagh_030.
Structure and substrate of the riverbed.	Working near the ditch heightens the risk of sediment input causing smothering of the bed strata and increased turbidity.  The ditch is approximately 600m from the Loobagh_030; the area is flat; it is likely most solids will settle in the ditch and little if any would reach the water body.	No impact	Increased pollution loads due to an increased impermeable area could result in increased sediment input to the water feature impacting the bed strata.  Swales provide treatment, no risk of deterioration or not meeting objectives.
Structure of the riparian zone.	No impact	No impact	No impact  Ditch banks lost to the culvert. Short section. Not significant. No impacts on Loobagh_030 itself.
<b>Groundwater Bodies: Charleville</b>			

Quality Element	Construction	Operation
Quantity and quality.	<p>Potential impact locally on groundwater flow and quality. Temporary. Potential reduction in groundwater level and modification in groundwater flow because of dewatering.</p> <p>Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives.</p>	<p>Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives.</p> <p>Use of swales potentially increases flows to groundwater systems; treated. Improvement on baseline conditions of existing roadside drainage.</p>

**XC209 Ballyhay**

Table 9B.7 Potential Effects on Waterbodies at XC209

Quality Element	Construction	Operation
<b>Surface Water Bodies: Awbeg (Buttevant) (East)_020</b>		
<b>Biological</b>		
Composition and abundance of aquatic flora.	Potential smothering of substrate flora by sediment. With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact.
Composition and abundance of aquatic fauna.	Potential for disturbance of invertebrates and fish. With implementation of mitigation, no risk of deterioration or not meeting objectives	None proposed. No impacts.
<b>Physico-chemical</b>		
Oxygenation, acidification and nutrient conditions.	No impact.	No impact.
		None proposed. No impacts.

Quality Element	Construction	Operation		
Sediment.	Working near and across the water body heightens the risks of sediment input, especially if dewatering of trench is required. With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact.	None proposed. No impacts.	None proposed. No impacts.
Noxious substances.	Potential for hydrocarbons in groundwater from road and railway; depending on depth of trench, could be mobilised during dewatering. With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact.	None proposed. No impacts.	None proposed. No impacts.
<b>Hydromorphology</b>				
Quantity and dynamics of water flow.	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives		None proposed. No impacts.	None proposed. No impacts.
Connection to groundwater bodies.	No impacts likely.		None proposed. No impacts.	None proposed. No impacts.
River depth and width variation.	No impact.	No impact.	None proposed. No impacts.	None proposed. No impacts.
Structure and substrate of the riverbed.	Risk of sediment input causing smothering of the bed strata and increased turbidity.  With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact.	None proposed. No impacts.	None proposed. No impacts.
Structure of the riparian zone	No impact.	No impact.	None proposed. No impacts.	None proposed. No impacts.
<b>Groundwater Bodies: Newtown Ballyhay</b>				

Quality Element	Construction	Operation	
Quantity and quality.	<p>Potential impact locally on groundwater flow and quality. Temporary. Potential reduction in groundwater level and modification in groundwater flow because of dewatering.</p> <p>Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives</p>	No impact.	<p>None proposed. No impacts.</p>

### **XC211 Newtown**

Table 9B.8 Potential Effects on Waterbodies at XC211

Quality Element	Construction	Operation	
	New Access Road	Compound	<p>New impermeable areas</p> <p>New culverts and river bridges/modifications to existing</p>
<b>Surface Water Bodies: Awbeg (Buttevant) (East)_020</b>			
<b>Biological</b>			
Composition and abundance of aquatic flora.	No impact likely. Connection to pond via roadside drains is distant and unlikely any pollutants would remain.	No compound at this site. Shared with XC212.	<p>Swales provide treatment for water quality. No risk of deterioration or not meeting objectives</p> <p>Small amount of habitat loss in ditch as culverted at bridge tie-in to regional road. Low value. No risk of deterioration or not meeting objectives</p>
Composition and abundance of aquatic fauna.	No impact likely. Connection to pond via roadside drains is distant and unlikely any pollutants would remain.		
<b>Physico-chemical</b>			
Oxygenation, acidification and nutrient conditions.	No impact likely.	No compound at this site. Shared with XC212.	<p>No impact.</p> <p>No impact.</p>
Sediment.	No clear pathway to a surface water receptor. Possible connection to a pond through roadside drainage.	No compound at this site. Shared with XC212.	<p>Increased pollution loads due to an increased impermeable area. Swales provide treatment, no risk of deterioration or not meeting objectives</p> <p>No impact.</p>

Quality Element	Construction		Operation	
Noxious substances.	No clear pathway to a surface water receptor. Possible connection to a pond through roadside drainage.	No compound at this site. Shared with XC212.	Increased pollution loads due to an increased impermeable area. Swales provide treatment, no risk of deterioration or not meeting objectives	No impact
<b>Hydromorphology</b>				
Quantity and dynamics of water flow.	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	No compound at this site. Shared with XC212.	The design of the drainage system means that there will be no net increase in runoff.	No impact.
Connection to groundwater bodies.	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and not significant at a WFD water body scale.	No compound at this site. Shared with XC212.	Use of swales potentially increases flows to groundwater systems; treated. Improvement on baseline conditions of existing roadside drainage.	No impact.
River depth and width variation.	No impact	No compound at this site. Shared with XC212.	No impact.	No impact.
Structure and substrate of the riverbed.	No impact.	No compound at this site. Shared with XC212.	No impact.	No impact.
Structure of the riparian zone.	No impact.	No compound at this site. Shared with XC212.	No impact.	No impact.
<b>Groundwater Bodies: Newtown Ballyhay</b>				
Quantity and quality.	Potential impact locally on groundwater flow and quality. Temporary. Potential reduction in groundwater level and modification in groundwater flow because of dewatering. Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives	No compound at this site. Shared with XC212.	Use of swales potentially increases flows to groundwater systems; treated. Improvement on baseline conditions of existing roadside drainage.	No significant impact.

**XC212 Ballycoskery**

Table 9B.9 Potential Effects on Waterbodies at XC212

Quality Element	Construction	Operation		
	New Bridge, car park and tie-in access roads.	Compound.	New impermeable areas.	New culverts and river bridges/modifications to existing.
<b>Awbeg (Buttevant) (East)_020</b>				
<b>Biological</b>				
Composition and abundance of aquatic flora.	Potential smothering of substrate flora by sediment. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential secondary impact on ditch ecosystem, passed to water body from spillage of any noxious substance. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Swales provide treatment for water quality. No risk of deterioration or not meeting objectives	Small amount of ditch habitat loss in ditch as culverted at bridge. Not a significant loss.
Composition and abundance of aquatic fauna.	Potential for disturbance of invertebrates and fish. With implementation of mitigation, no risk of deterioration or not meeting objectives			
<b>Physico-chemical</b>				
Oxygenation, acidification and nutrient conditions.	Concrete washings could contribute to increased acidification. With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact likely.	No impact.	No impact.
Sediment	Working in and near the ditch heightens the risks of sediment input. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential silty water runoff from stripped soil. Compound will be laid with gravel. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Increased pollution loads due to an increased impermeable area could result in increased input of sediment to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives.	No impact.
Noxious substances	Working near the ditch heightens the risks of hazardous material spillages. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential for oil and chemical spills from material stored at the compound. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Increased pollution loads due to an increased impermeable area could result in increased input of hydrocarbons and metals to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives.	No impact.
<b>Hydromorphology</b>				

Quality Element	Construction	Operation	
Quantity and dynamics of water flow.	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	The design of the drainage system means that there will be no net increase in runoff. No changes to established field drains. Installation of pipe culvert for ditch crossing at tie-in.
Connection to groundwater bodies.	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	No impact.  Reduced connectivity at culvert but short (less than 10m). No significant impact.
River depth and width variation.	No impact.	No impact.	No impact.  Culvert will alter ditch dimensions but will be large enough to ensure adequate flow.
Structure and substrate of the riverbed.	Working near the ditch heightens the risk of sediment input causing smothering of the bed strata and increased turbidity.  With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact.	Increased pollution loads due to an increased impermeable area could result in increased sediment input to the water feature impacting the bed strata.  Swales provide treatment, no risk of deterioration or not meeting objectives.  Culvert will initially alter bed strata; will be embedded below riverbed level and will naturally reinstate ditch bed.
Structure of the riparian zone.	No impact.	No impact.	No impact.  Ditch banks lost to the culvert. Short section. Not significant.

**Groundwater Bodies: Newtown Ballyhay**

Quantity and quality.	Potential impact locally on groundwater flow and quality. Temporary. Potential reduction in groundwater level and modification in groundwater flow because of dewatering.  Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Use of swales potentially increases flows to groundwater systems; treated. Improvement on baseline conditions of existing roadside drainage.	No significant impact.
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**XC215 Shinanagh**

Table 9B.10 Potential Effects on Waterbodies at XC215

Quality Element	Construction		Operation	
	New Access Road.	Compound.	New impermeable areas.	New culverts and river bridges/modifications to existing.
<b>Surface Water Bodies: Awbeg (Buttevant) (East)_010</b>				
<b>Biological</b>				
Composition and abundance of aquatic flora.	Potential smothering of substrate flora in local ditch by sediment. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential secondary impact on ditch ecosystem, passed to water body from spillage of any noxious substance. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Swales provide treatment for water quality. No significant impact.	None proposed. No impact.
Composition and abundance of aquatic fauna.	Potential for disturbance of invertebrates and fish in local ditch. With implementation of mitigation, no risk of deterioration or not meeting objectives			
<b>Physico-chemical</b>				
Oxygenation, acidification and nutrient conditions.	No impact likely.	No impact likely.	No impact.	None proposed. No impact.
Sediment.	Local ditch on field margins; connects to main water body. Working in and near the ditch heightens the risks of sediment input. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential silty water runoff from stripped soil. Compound will be laid with gravel. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Increased pollution loads due to an increased impermeable area could result in increased input of sediment to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives.	None proposed. No impact.
Noxious substances.	Local ditch on field margins; connects to main water body. Working near the ditch heightens the risks of hazardous material spillages. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential for oil and chemical spills from material stored at the compound. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Increased pollution loads due to an increased impermeable area could result in increased input of hydrocarbons and metals to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives.	None proposed. No impact.
<b>Hydromorphology</b>				
Quantity and dynamics of water flow.	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	The design of the drainage system means that there will be no net increase in runoff.	None proposed. No impact.

Quality Element	Construction	Operation	
Connection to groundwater bodies.	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	No impact.  None proposed. No impact.
River depth and width variation.	No impact.	No impact.	No impact.  None proposed. No impact.
Structure and substrate of the riverbed.	Local ditch on field margins; connects to main water body. Working near the ditch heightens the risk of sediment input causing smothering of the bed strata and increased turbidity.	No impact.	Increased pollution loads due to an increased impermeable area could result in increased sediment input to the water feature impacting the bed strata.  Swales provide treatment, no risk of deterioration or not meeting objectives.
Structure of the riparian zone.	No impact.	No impact.	No impact.  None proposed. No impact.
<b>Groundwater Body: Ballyhoura Kiltorcan and Mitchelstown</b>			
Quantity and quality.	Potential impact locally on groundwater flow and quality. Temporary. Potential reduction in groundwater level and modification in groundwater flow because of dewatering.  Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no significant impact.  Mitchelstown GWB is outside of the redline boundary but in close proximity; it has poor quality and is At Risk from nutrients. No nutrient load likely from the activities here.	Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no significant impact.	Use of swales potentially increases flows to groundwater systems; treated. Improvement on baseline conditions of existing roadside drainage.  No nutrient load during operation; no worsening of the At Risk GWB.

**XC219 Buttevant**

Table 9B.11 Potential Effects on Waterbodies at XC219

Quality Element	Construction	Operation
	New Bridge, culverts and road tie-ins.	Compound.
<b>Surface Water Bodies: Awbeg (Buttevant) (East)_020</b>		
<b>Biological</b>		
Composition and abundance of aquatic flora.	Potential smothering of substrate flora by sediment. In-stream working, in close proximity to SAC. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential secondary impact on ditch ecosystem, passed to water body from spillage of any noxious substance. With implementation of mitigation, no risk of deterioration or not meeting objectives.
Composition and abundance of aquatic fauna.	Potential for disturbance of invertebrates and fish. In-stream working, in close proximity to SAC. With implementation of mitigation, no risk of deterioration or not meeting objectives	Swales provide treatment for water quality. No significant impact.
<b>Physico-chemical</b>		
Oxygenation, acidification and nutrient conditions.	Concrete washings could contribute to increased acidification. With implementation of mitigation, no risk of deterioration or not meeting objectives	No impact likely.
Sediment.	Works in and on banks of two watercourses, part of main water body. Installation of culverts on each. Potential for silty water runoff, and disturbed bed strata creating sedimentation plumes. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential silty water runoff from stripped soil. Compound will be laid with gravel. With implementation of mitigation, no risk of deterioration or not meeting objectives.
		Increased pollution loads due to an increased impermeable area could result in increased input of sediment to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives.
		No impact.

Quality Element	Construction	Operation	
Noxious substances.	Working in and on the banks of the watercourses heightens the risks of hazardous material spillages. With implementation of mitigation, no risk of deterioration or not meeting objectives	Potential for oil and chemical spills from material stored at the compound. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Increased pollution loads due to an increased impermeable area could result in increased input of hydrocarbons and metals to the ditch. Swales provide treatment, no risk of deterioration or not meeting objectives.
<b>Hydromorphology</b>			
Quantity and dynamics of water flow.	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	Temporary alterations of local drainage networks. No risk of deterioration or not meeting objectives	The design of the drainage system means that there will be no net increase in runoff.
Connection to groundwater bodies.	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	Temporary disturbance to groundwater connectivity (where present) during the Construction Phase. However, impacts considered to be temporary and no risk of deterioration or not meeting objectives	No impact.
River depth and width variation.	Temporary increases to depth and width for installation of the culverts.	No impact.	No impact.
Structure and substrate of the riverbed.	Temporary loss of bed strata at culverts until reinstatement established. Potential increased sedimentation in bed strata downstream. With mitigation measures neither impact presents a risk of deterioration or not meeting objectives.	No impact.	Increased pollution loads due to an increased impermeable area could result in increased sediment input to the water feature impacting the bed strata. Swales provide treatment, no risk of deterioration or not meeting objectives.
			Culvert will initially alter bed strata; will be embedded below riverbed level and will naturally reinstate ditch bed.

Quality Element	Construction	Operation		
Structure of the riparian zone.	Temporary increased loss of riparian zone to all installation of culverts. Will reduce to smaller permanent loss during operation.	No impact.	No impact. Riverbanks lost to the culverts. Short sections. Not significant. No impacts on Awbeg (Buttevant) (East)_020.	
<b>Groundwater Bodies: Mitchelstown</b>				
Quantity and quality.	Potential impact locally on groundwater flow and quality. Temporary. Potential reduction in groundwater level and modification in groundwater flow because of dewatering. Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives. No increased nutrient load.	Potential deterioration in groundwater quality because of suspended solids and contaminants (oils and chemicals), spills/leaks. With implementation of mitigation, no risk of deterioration or not meeting objectives.	Use of swales potentially increases flows to groundwater systems; treated. Improvement on baseline conditions of existing roadside drainage. No increased nutrient load.	Interruption in connection to surface water bodies at culverts. No risk of deterioration or not meeting objectives

## 9B.8 Protected Areas

Article 4.9 of the WFD specifies that where an area requires special protection under another EC Directive, or where water is used for the abstraction of drinking water, then these areas should be identified as '*protected areas*'. Such areas have their own objectives and standards. Where water body boundaries overlap with protected areas, the most stringent objective applies – that is the requirements of one particular EC Directive and should not undermine the requirement of another.

As Ireland designated the entire territory as subject to the Nitrates Directive, the proposed Project lies within a Nitrate Vulnerable Zone. Additionally, nitrate susceptibility mapping suggests the proposed Project crosses a number of areas with very low to high near surface nitrate susceptibility and subsurface nitrate susceptibility.

Protected areas within the study area for the proposed Project are provided in Table 9B.11.

Table 9B.0.12 : Areas and water bodies protected under EU legislation that are crossed by the proposed project or lie within the boundaries of the proposed project

Legislation	WFD Water Bodies	Impacts
Nitrates Directive (91/676/EEC)	All	No impacts anticipated from the proposed Project.
Drinking Water Directive (98/83/EEC)	Loobagh_030 Charleville GWB Ballyhoura Kiltorcan GWB Mitchelstown GWB	Protected for abstracted drinking water. With mitigation measures, no impacts predicted.

Legislation	WFD Water Bodies	Impacts
Urban Waste Water Treatment Directive (91/271/EEC)	Awbeg (Buttevant) (East)_020	Identified as having pressures relating urban wastewater treatment. No nutrient or organic pollution possible from the proposed Project. No impacts on these standards.
EU Birds Directive (79/409/EEC)	N/A	Kilcolman Bog SPA: 4km from the proposed Project. Whooper swan in close proximity to XC187 and XC215. No impacts predicted.
EU Habitats Directive (92/43/EEC)	Awbeg (Buttevant) (East)_020	Water body forms part of the Blackwater River (Cork/Waterford) SAC. Close hydrological connections at several sites. With mitigation measures, no significant impacts predicted.

There are no significant impacts on protected areas or any potential for a worsening of standards under other directives.

## 9B.9 Conclusions

Stage 3 assessed the compliance of the proposed Project with the achievement of the following WFD objectives, relating to the WFD quality elements:

- cause a deterioration in the overall status or potential;
- result in any of the proposed mitigation measures or actions assigned under the WFD from being implemented, effecting the achievement of good status/potential; and/or,
- render existing mitigation measures or actions ineffective, resulting in the WFD water body from failing to achieve good status/potential.

The WFD assessment for the proposed Project has been set out against these three objectives and is summarised in Table 9B.12. The assessment for each WFD water body has accounted for the impacts associated with the proposed Project, cumulative effects and any interactions with other WFD water bodies. Cumulative impacts and interactions are assessed in the primary assessment chapters in Volume 3, Chapter 7 Biodiversity, Chapter 8 Soils, Land and Hydrogeology and Chapter 9 Water.

It is concluded that there would not be no discernible change to the surface water and groundwater WFD water bodies as a consequence of the proposed Project. There would be no deterioration in the quality elements or status/potential of the WFD water bodies; no prevention of any WFD water body from achieving or continuing to achieve Good status; nor would the capacity of the WFD water bodies to deliver other EU legislation requirements be compromised.

As a consequence, the proposed Project is considered to meet the WFD legislative requirements

## **9B.10 References**

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (the Water Framework Directive (WFD))

S.I. 722/2003 European Union (Water Policy) Regulations 2003 (WFD Regulations)

River Basin Management Plan for Ireland 2018 – 2021 (Government of Ireland, 2018)

UK Planning Inspectorate Advice Note 18: Water Framework Directive (Planning Inspectorate, 2017)