Irish Water
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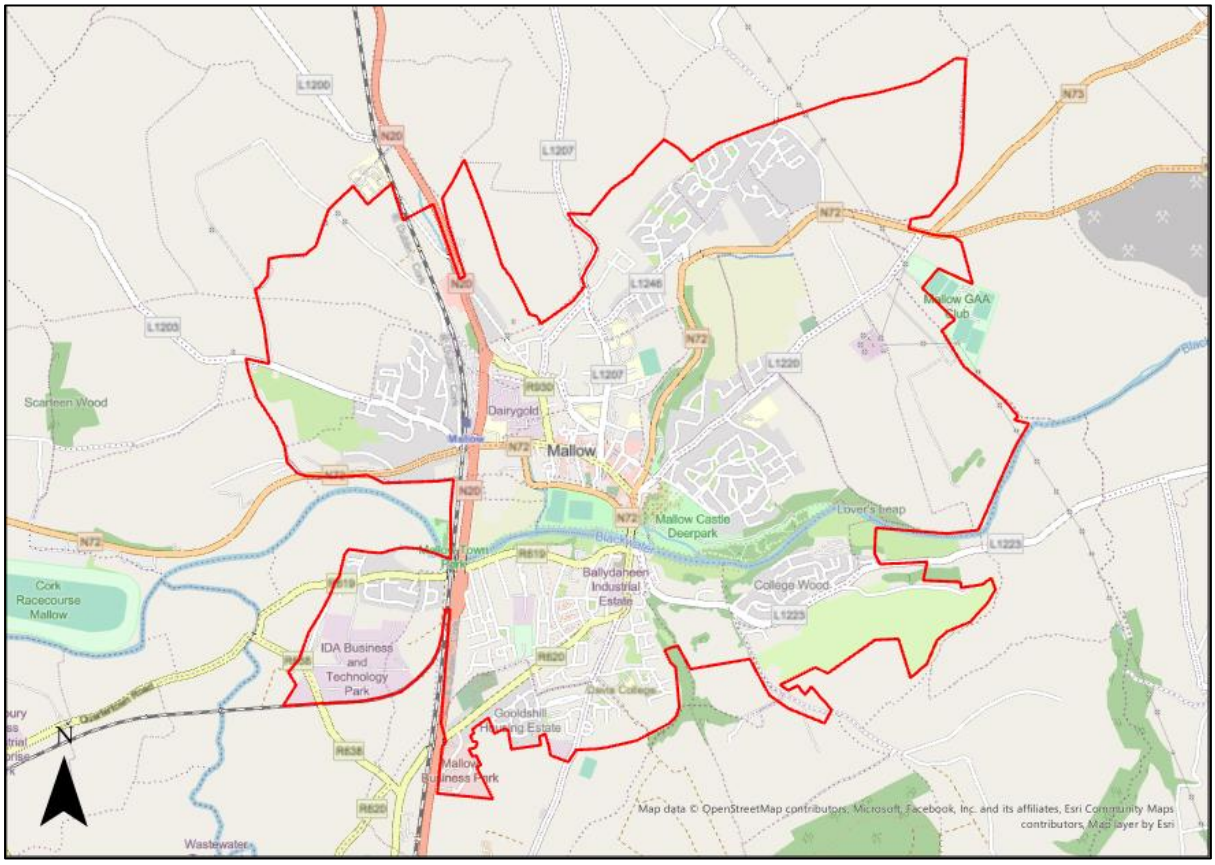
MALLOW WASTE WATER DISCHARGE LICENCE REVIEW – D0052-01

ENVIRONMENTAL IMPACT ASSESSMENT REPORT - NON-TECHNICAL SUMMARY



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NOVEMBER 2022

IRISH WATER

MALLOW WASTE WATER DISCHARGE LICENCE REVIEW

EIAR NON-TECHNICAL SUMMARY

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NOVEMBER 2022

PROJECT NO. 20893-06					
Revision	**Reason for Revision**	**Prepared by**	**Reviewed by**	**Approved by**	**Issue Date**
A	Internal Review	NOD	CAS/KF	CAS	21/11/2022
B	Version for Client Review	NOD	CAS/KF	CAS	22/11/2022
Final	Final	NOD	CAS/RC	CAS	29/11/2022

CONTENTS

1. INTRODUCTION

An Environmental Impact Assessment Report (EIAR) has been prepared in support of an application made to the Environmental Protection Agency (EPA) by Irish Water (IW) for the Mallow Waste Water Discharge Licence (WWDL) D0052-01 Review Application.

The subject matter of this EIAR solely includes the Mallow agglomeration operational discharges, namely, (i) a Primary Discharge (SW001) from the upgraded Mallow WwTP, and (ii) a Dual Function Overflow (SW010) from the new Bridge Street Pumping Station and is referred to as the "*the Project*" in this document.

This document is a summary of the information contained in the EIAR. For detailed information please consult the main EIAR document.

1.1. Location of the Project

Figure 1.1 shows the location of the Mallow Waste Water Treatment Plant (WwTP) and the new Bridge Street Pumping Station and associated operational discharges, SW001 and SW010.

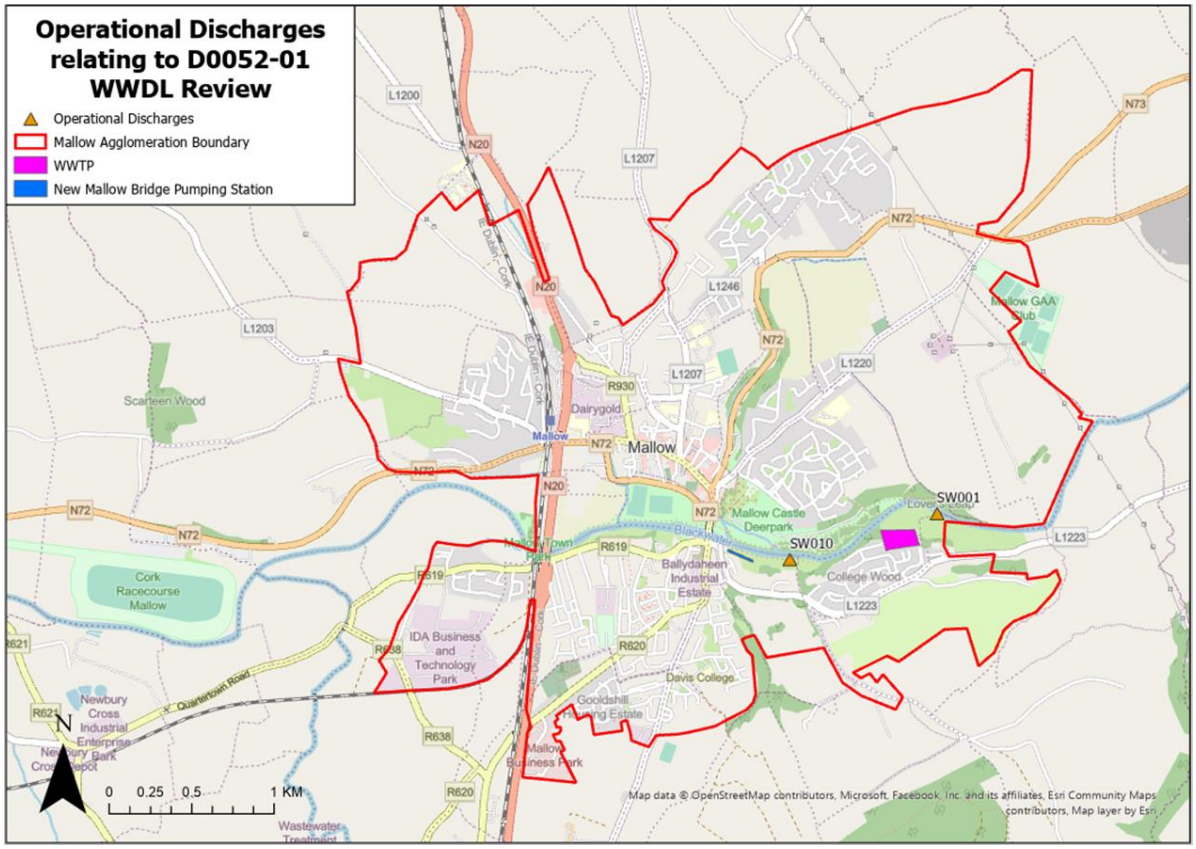

Figure 1.1 Location of Mallow Agglomeration (red line), Mallow WwTP and the New Bridge Street Pumping Station and Operational Discharges, SW001 and SW010

1.2. Background

1.2.1. Mallow Sewerage Scheme Upgrade Project

The Mallow agglomeration (D0052-01), (*i.e.*, the area in Mallow which is connected *via* a pipe network to the Mallow WwTP), is currently served by a sewerage system which comprises mainly combined sewers in the Town Centre area, with separated foul and storm

water drainage in newer developments on the outskirts of the town. A number of streets in the town have separate surface water sewers which discharge to local streams or to the River Blackwater.

The existing sewer network in Mallow contains a number of Storm Water Overflows (SWOs) which frequently discharge untreated wastewater to the River Blackwater in the absence of any stormwater storage.

The Waste Water Treatment Plant (WwTP) at Ballyellis, Mallow, has a current operational plant capacity of 10,500 population equivalent (p.e.). The current design capacity of the WwTP is 18,000 p.e, however, only 1 no. process stream is currently operational, thereby limiting the capacity of the plant. In its current form and setup, the plant is organically overloaded and cannot cater for the existing loads from the agglomeration.

The Mallow agglomeration is currently in breach of Articles 3, 4(1), 5(1) and 12 of the Urban Wastewater Treatment Directive (UWWTD) (91/271/EEC) and as such is the subject of an infringement notice from the European Court of Justice (ECJ).

To rectify the above issues, and to ensure that the Mallow agglomeration is operating in compliance with the UWWTD and the Waste Water Discharge Licence (WWDL) D0052-01, a project called the Mallow Sewerage Scheme Upgrade Project is being progressed by IW. In April 2019, IW applied to Cork County Council Planning Authority under Section 34 of the Planning and Development Act, 2000 (as amended) for the Mallow Sewerage Scheme Upgrade Project (Ref. Planning Register Number: 195078). A final grant of planning was obtained on 13th January 2020, subject to 41 no. conditions.

As part of their planning determination, Cork County Council, as the Competent Authority (CA), carried out an EIA screening and they concluded that neither a mandatory nor a sub-threshold EIAR was required for the Mallow Sewerage Scheme Upgrade Project itself.

This Upgrade Project is split into 2 no. contracts, namely (i) The Networks Upgrade Contract, and (ii) The Mallow WwTP Upgrade and new Mallow Bridge Pumping Station Contract.

The Networks Upgrade Contract involves largely the upgrading of the sewer network through the removal of 9 SWOs and constructing new sewers. The Mallow WwTP Upgrade and new Mallow Bridge Pumping Station Contract broadly involves the upgrade of the existing Mallow WwTP to 22,000 p.e, a new Mallow Bridge Pumping Station on the site of an existing Pumping Station, and also the provision of stormwater storage at the new Pumping Station site.

The Networks Upgrade Contract commenced on site in April 2021 and works are ongoing with an estimated completion date of January 2023. The Mallow WwTP Upgrade and new Bridge Street Pumping Station Contract commenced in May 2021 and works are ongoing with an estimated completion date of December 2023. Refer to **Section 1.2.2** of the EIAR for more details.

After completion of the Mallow Sewerage Scheme Upgrade Project, there will be only 2 no operational discharges within the agglomeration *i.e.,* the Primary Discharge (SW001) which will be discharging treated waste water to the Blackwater River, and a Dual Function Overflow which will discharge only during a storm event or an emergency event from the Mallow Bridge Pumping Station to the River Blackwater.

The two operational discharges are the subject of this EIAR. **Section 2.2** of this Non-Technical Summary explains why an EIAR was requested at this stage.

1.2.2. Need for D0052-01 Waste Water Discharge Authorisation Review

Following an examination by the of the Mallow Waste Water Discharge Authorisation (WWDA) in June 2021, the EPA concluded that the current WWDA does not satisfy the environmental requirements of the Waste Water Discharge (Authorisation) Regulations 2007, as amended. The reasoning for their conclusion and recommendation for a review of the current WWDA D0052-01 was based on the following:

1. The licence was granted over 3 years ago;
2. Planning permission has been granted for proposed development works associated with the licence;
3. The agglomeration is included in IW's investment plan; and
4. Non-compliances with Specified Improvement Programme in the current licence.

Along with the above, this WWDA review relates to the following:

- An increase in treatment capacity at Mallow WwTP to 22,000 p.e.
- Amendment to the agglomeration boundary
- Inclusion of an additional SWO discharge location (SW010).

1.2.3. Subject Matter of EIAR

As mentioned, this EIAR being submitted with this WWDL Review Application considers the impact of the operational discharges associated with the Mallow agglomeration after the completion of the Mallow Sewerage Scheme Upgrade Project.

It does not assess the impacts associated with the construction of the Mallow Sewerage Scheme Upgrade Project which has already received planning permission (Cork County Council Planning Reg No. 19/05078.

A description of the operational discharges which are the subject matter of the Mallow WWDL Review Application is provided in **Chapter 3** of the EIAR main document.

1.2.4. EIAR Team

Table 1.1 lists the competent experts who were involved in the preparation of each Chapter of the EIAR.

Table 1.1:EIA Chapters and Competent Experts

EIA Chapter	Company	Name & Qualifications
Chapter 1 - Introduction	Nicholas O'Dwyer Ltd.	Krista Farrugia, Principal EIA Consultant, BSc, MSc, PgDip, PIEMA Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 2 - The EIA Process		
Chapter 3 - Description of the Project and Site		
Chapter 4 – Policy & Legislative Context		
Chapter 5 - Biodiversity	Thorne Ecology	Kate Harrington, Principal Ecologist, MSc, MCIEEM

EIA Chapter	Company	Name & Qualifications
Chapter 6 - Water	AWN Consulting Ltd.	Teri Hayes, Director, BSc MSc PGeol EurGeol
Chapter 7 - Population & Human Health	Enviroguide Consulting	Janet O'Shea, Technical Director, BSc, IEMA, MCIWM, C. Env
Chapter 8 - Material Assets	Enviroguide Consulting	Charlotte Lawler-Greene, Principal Environmental Consultant, BSc, MSc
Chapter 9 - Traffic and Transport	Nicholas O'Dwyer Ltd.	Graham Young, Nicholas O' Dwyer Ltd., Senior Engineer, CEng, Dip. PM, BA BAI
Chapter 10 - Air Quality and Climate	AWN Consulting Ltd.	Ciara Nolan, Senior Air Quality Consultant, MSc, BSc, AMIAQM, AMIEnvSc
Chapter 11 - Noise and Vibration	AONA Environmental Consulting Ltd.	Mervyn Keegan, Director, MSc, BSc, MIAQM, MIOA
Chapter 12 - Odour	AWN Consulting Ltd.	Ciara Nolan, Senior Air Quality Consultant, MSc, BSc, AMIAQM, AMIEnvSc
Chapter 13 - Archaeology, Architectural and Cultural Heritage	Courtney Deery Heritage Consultancy Ltd.	Lisa Courtney, Director, BA, MSc, IAI, ICOMOS
Chapter 14 - Lands, Soils and Geology	AWN Consulting Ltd.	Teri Hayes, Director, BSc MSc PGeol EurGeol
Chapter 15 - Landscape and Visual	Stephenson Halliday	Daniel Leaver, Associate Director, BSc, MSc, CMLI
Chapter 16 - Risk of Major Accidents and/or Disasters	Nicholas O'Dwyer Ltd.	Krista Farrugia, Principal EIA Consultant, Nicholas O' Dwyer Ltd., BSc, MSc, PgDip, PIEMA
Chapter 17 - Interactions	Nicholas O'Dwyer Ltd.	Krista Farrugia, Principal EIA Consultant, Nicholas O' Dwyer Ltd., BSc, MSc, PgDip, PIEMA Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 18 – Schedule of Mitigation Measures	Nicholas O'Dwyer Ltd.	Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 19 - Bibliography	Nicholas O'Dwyer Ltd.	Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 20 – Abbreviations	Nicholas O'Dwyer Ltd.	Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc

In addition to the main contributors to the EIAR, information on the contents of this EIAR was sought from relevant stakeholders in an EIA scoping consultation process. Refer to **Section 2.3** below for further details.

2. EIA PROCESS

2.1. Introduction

The process by which the *likely significant effects* of a Project on the environment are assessed is set out in the EU EIA Directive 2011/92/EU and has been transposed to Irish law in terms of Waste Water Discharges by S.I. No. 214/2020 - European Union (Waste Water Discharge) Regulations 2020.

The EIA process includes a number of key characteristics:

- It is systematic, comprising a sequence of tasks defined both by regulation and by practice;
- It is analytical, requiring the application of specialist skills from the environmental sciences;
- It is impartial, its aim being to inform the decision-makers;
- It is consultative, with provision being made for obtaining feedback from interested parties, including local authorities and statutory agencies; and
- It is interactive, allowing opportunities for environmental concerns to be addressed during the planning, design, and implementation of a project.

The structure and general sequence of this EIAR follows the EPA Guidelines (2022). The process may be summarised succinctly as follows:

- Screening – Is an EIA required?
- Scoping – If EIA is required, what aspects of the Environment should be considered?
- Preparation of EIAR

The EIAR informs the EIA process being conducted by the Competent Authority (CA), which in this case is the EPA, as part of the WWDA process.

2.2. EIA Screening

This Project involves a WWD Review Application for a Waste Water Treatment Plant (WwTP) with a capacity of greater than 10,000 p.e as defined in Article 2, point (6), of the UWWTD. Therefore, a mandatory EIA, and the preparation of an EIAR is required for this Project to inform the WWDA process.

2.3. EIA Scoping Process

The scoping stage of an EIA is a process of determining the content and extent of the matters which should be covered in the environmental information to be assessed in the EIAR.

Nicholas O' Dwyer Ltd., on behalf of IW, prepared a Scoping Report describing the nature of the operational discharges from the Mallow agglomeration, the need for the project,

and for each environmental factor as listed in the EIA Directive, the baseline environment, proposed assessment methodology and potential for likely significant effects.

On 30th August 2022, in accordance with Regulation 17C of the European Union (Waste Water Discharge) Regulations 2007, as amended, IW submitted an EIA Scoping Report to the EPA with a request for the Agency to provide its opinion in writing on the scope and level of detail of the information required to be included in the EIAR.

The Agency consulted with the below listed bodies on 31st August 2022:

- Minister for Agriculture, Food and the Marine;
- Inland Fisheries Ireland;
- Development Applications Unit (Department of Housing, Local Government and Heritage);
- An Taisce;
- Health Service Executive;
- Health and Safety Authority;
- Fáilte Ireland;
- An Bord Pleanála; and
- Cork County Council (Planning Section and Environment Section)

Cork County Council was the only consultee to submit a response, which is provided below:

- *The proposed operational discharges will discharge in the Blackwater (Munster)_130 and Blackwater (Munster)_140, both of which have a WFD 2013-2018 designation of "GOOD" status. The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (Margaritifera margaritifera) catchment under the First Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) and is also a Special Area of Conservation designated for the protection of a range of freshwater species and habitats. The EPA as competent authority to confirm through the EIA and AA processes that licence emission limit values are established at limits which can ensure that Ecological Quality Objectives as set out in the fourth schedule of the FWPM Regulations can be maintained, and that the Conservation Objectives for all qualifying interests of the Special Area of Conservation are also met.*
- *EPA to review EIAR scoping conclusion that there is no potential impact in relation to Air Quality, particularly odour, and verify rational used was appropriate.*

The scoping response received from Cork County Council above and the Scoping Opinion received from the EPA, as detailed in **Section 2.3.3** of the EIAR document, were taken into consideration throughout the process of preparing this EIAR.

2.4. EIAR Structure

The composition of this EIAR is in accordance with EPA Guidelines (2022) which requires that information contained within an EIAR should be in accordance with the EIA Directive 2014/52/EU.

This EIAR has been prepared with consideration of the EPA's "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"* (May 2022),

and the *"Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment",* Department of Housing, Planning and Local Government (August 2018).

The overfall structure of the EIAR is as follows:

- Chapter 1 - Introduction
- Chapter 2 – The EIA Process
- Chapter 3 - Description of the Project and Site
- Chapter 4 – Policy & Legislative Context
- Chapter 5 - Biodiversity
- Chapter 6 - Water
- Chapter 7 – Population & Human Health
- Chapter 8 - Material Assets
- Chapter 9 – Traffic and Transportation
- Chapter 10 - Air Quality and Climate Change
- Chapter 11 - Noise and Vibration
- Chapter 12 – Odour
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- Chapter 15 - Landscape & Visual
- Chapter 16 – Risk of Major Accidents and/or Disasters
- Chapter 17 – Interactions
- Chapter 18 – Schedule of Mitigation Measures
- Chapter 19 – Bibliography
- Chapter 20 – Abbreviations
- Appendix 1 – Criteria for Rating Site Attributes – Estimation of Importance of Hydrology Attributes
- Appendix 2 – Waste Assimilative Capacity Calculations
- Appendix 3 – Water Framework Directive Assessment

3. DESCRIPTION OF PROJECT – OPERATIONAL DISCHARGES

Chapter 1 of the EIAR provides full details on the background and a description of the existing Mallow WwTP and the upgrades to the WwTP and Network under the Mallow Sewerage Scheme Upgrade Project.

Chapter 3, **Section 3.3** of the EIAR provides details on the operational discharges of the Mallow agglomeration *i.e.*, the subject matter of this EIAR. A summary of the operational discharges is provided below.

3.1. Primary Discharge (SW001)

The primary discharge (SW001) from the upgraded Mallow WwTP will remain the same as it was prior to the Mallow Sewerage Scheme Upgrade Project and will continue to discharge to the River Blackwater at NGR 157530E, 098140N.

The location of the Primary Discharge (SW001) is shown in **Table 3.1** and on **Figure 1.1** above.

3.2. Dual Function Overflow (SW010) at Bridge Street Pumping Station

There will be a single Dual Function Overflow (SW010) at the new Bridge Street Pumping Station *i.e.,* this is an overflow which can act as a Storm Water Overflow (SWO) or as an Emergency Overflow (EO) depending on the event. The location of the Dual Function Overflow (SW010) is shown in **Table 3.1** and on **Figure 1.1**.

The SWO has been designed to operate to meet the definition of '*Storm Water Overflow'* as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows'*, 1995.

The following important design measures will be in place to prevent unintended discharges to the River Blackwater:

- A 2,400m^3 Stormwater Holding Tank will be provided at the new Pumping Station, flows in excess of the Stormwater Tanks capacity will overflow to the Blackwater River;
- Overflows from the Storm Water Holding Tank will be screened by self-cleaning mechanical screens with a maximum passage of 6mm;
- The project will include the installation of a new SCADA and telemetry system, this system will ensure compliance and compatibility with IW's Design Specifications;
- Provision for a standby power supply will be made at the new Mallow Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply;
- Provision for a standby power supply will be made at the Mallow WwTP to provide for continued operation of the wastewater treatment equipment in the event of an interruption in the power supply; and
- All flows will be monitored continuously and recorded by flowmeters at the WwTP and Mallow Bridge Street Pumping Station.

In the event that the storm water tank is at capacity (>2,400m^3) an overflow from the storm tank will be discharged to the River Blackwater *via* the new SWO. As listed above, overflows to the storm water storage tank will be screened *via* a self-cleaning mechanical screen with a maximum passage of 6mm.

Provision for a standby power supply will be made at new Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the very unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the River Blackwater *via* the EO.

Table 3.1 Operational Discharges Relating to The Mallow WWDA Review

New Discharge Name	Type	Asset	Discharge Location (NGR)
SW001	Primary Discharge	WwTP	157530E 098140N
SW010	Dual Function Overflow (Storm Water Overflow & Emergency Overflow)	New Bridge Street Pumping Station	156636E 097862N

3.3. Waste Water Treatment Plant Design

Planning Permission was obtained based on the upgraded WwTP (22,000 p.e.) meeting the Emission Limit Values (ELV) as per Schedule A.1. of the WWDL D0052-01 (Tech Amendment A): BOD 25mg/l, COD 125mg/l, SS 25mg/l, pH 6-9 pH units, Total Phosphorous 2mg/l, Ammonia 3mg/l and Ortho-phosphate 1.5mg/l.

Since planning was obtained in 2019, an updated Waste Assimilative Capacity (WAC) calculation was completed in 2022 to inform this WWDA review application to ensure that the above ELVs were fit for purpose based on the latest data available (see **Appendix 2** of main EIAR Document for a copy of the Waste Assimilative Capacity Calculation). This calculation was used to examine the dilution and the capacity of the River Blackwater to receive the treated discharge without impacting the waterbody. It was concluded that a more onerous Ortho-phosphate ELV of 1mg/l was required in order to meet the High-status 95%ile Environmental Quality Standard (EQS) downstream of the primary discharge.

Based on the ELVs in **Table 3.2** below the receiving waterbody has the capacity to accommodate the proposed discharge from the upgraded WwTP without causing a breach in the relevant standards as outlined in National and European legislation. This includes ensuring compliance with the High standards set in the European Communities Environmental Objectives (Surface Water) Regulations, 2009, as amended (now S.I. No. 288 of 2022). It also ensures that the 2013-2018 High status of both Ammonia and Ortho-phosphate of the Blackwater (Munster)_140 is maintained. Ecological Quality Objectives as set out in the fourth schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) can also be maintained.

Table 3.2 presents the proposed ELVs for the upgraded Mallow WwTP.

Table 3.2 Proposed Emission Limit Values (ELVs)

Parameter	Proposed Emission Limit Value (ELV)
Biological Oxygen Demand	25 mg/l
Chemical Oxygen Demand	125 mg/l
Suspended Solids	25 mg/l
Ortho-phosphate (as P)	1 mg/l
Total Phosphorous (as P)	2 mg/l
Ammonia (as N)	3 mg/l
pH	6 - 9

The Mallow Sewerage Scheme Upgrade Project has been designed to ensure that emissions from the works will not result in the contravention of any relevant EU Directives and National Regulations in accordance with IW's Design Specifications.

3.4. Consideration of Alternatives

3.4.1. "*Do Nothing*" Scenario

In the absence of the Mallow Sewerage Scheme Upgrade Project, there is the possibility that there would be inadequate treatment capacity within the treatment plant to meet the needs of the area served. It is likely that there would be an increase in discharges of untreated waste water to the Blackwater River during storm events. This would result in ineffective management of the waste water treatment process and risks to the environment and public health. It is therefore considered that the "*Do-Nothing*" scenario is not an option.

A "*do-nothing scenario"* is also not an option given the requirements to comply with EPA Discharge Licence Schedule of Improvements and the ECJ ruling.

3.4.2. Alternative Locations

The proposed development at Mallow WwTP is required to provide for an increase in treatment capacity to 22,000 p.e. The option of providing this additional treatment capacity in a separate treatment facility located elsewhere in the catchment is not realistic, given the configuration of the sewer network in Mallow, and the degree to which spare capacity in some of the existing treatment units can be utilised.

The removal of SWOs on the sewer network in Mallow town will result in increased flows arriving at the Bridge Street Pumping Station, necessitating the provision of the new Pumping Station and stormwater holding tank.

4. BIODIVERSITY

Chapter 5 of the EIAR prepared by Thorne Ecology provides an Ecological Impact Assessment (EcIA) of the Mallow agglomeration operational discharges.

The 2 no. operational discharges directly discharge to the Blackwater River (Cork/Waterford) Special Area of Conservation (SAC). The SAC is designated for the following aquatic habitats and species: Vegetation of flowing waters, Alluvial forests, Freshwater Pearl Mussel, White-clawed Crayfish, Sea Lamprey, River Lamprey, Twaite Shad, Salmon, and Otter, under the Habitats Directive.

Full details of the assessment on European Sites including the Blackwater River (Cork/Waterford) SAC are provided in a combined AA Screening and NIS Report prepared for the Mallow WWDL Review Application. Refer to **Attachment D.2.2** of the WWDA Review Application Documentation.

The river habitat of the River Blackwater, in terms of its physical attributes and vegetation is of high quality in the reach within the Zone of Influence (ZoI) of the operational discharges. While Annex I habitats were not observed in the survey area during a site survey conducted on the September 12th 2022 to inform this EIA Chapter, they are likely to be present downstream due to the SAC designation. The River Blackwater habitat is therefore considered to be a Key Ecological Receptor (KER) of International Importance.

In terms of Nationally Designated Sites, the Blackwater Valley (Killavullen) (001080) proposed Natural Heritage Area (pNHA) is located *ca.* 12km downstream of Mallow along the River Blackwater and the Blackwater Valley (Ballinvurrig Wood) (001793) pNHA is located *ca.* 15km downstream. Sites designated as pNHAs are considered to have National value. These sites overlap with the Blackwater River (Cork/Waterford) SAC designation, providing some habitats, flora and fauna with a higher level of protection, although not encompassing the entire biodiversity of these areas. As there is a potential impact pathway *via* the Blackwater River to both of these pNHAs, these sites are considered to be KERs.

Breeding Kingfisher has been recorded in Mallow area, however, no Kingfisher nesting sites were recorded by DixonBrosnan (2019b) within the study area during surveys to inform the Mallow Sewerage Scheme Upgrade Project. The National Biodiversity Data Centre (NBDC) holds records of Annex I species Kingfisher, Little Egret and Golden Plover (Annex I) from 2011, several Annex II waterbird species, as well as the Red-listed birds of conservation concern, Black-headed gull, Curlew, Herring Gull, Lapwing and Shoveler. Surveys undertaken for the Mallow Sewerage Scheme Upgrade Project recorded grey wagtail, a red-listed breeding species which is associated with river habitats. These birds of conservation importance could be sensitive to any eutrophication impacts affecting their ability to fish or forage, and are therefore considered to be KERs of Local Importance (Higher Value)

There are records of Otter throughout the Blackwater River and tributaries, the latest NBDC record in the vicinity of Mallow being from 2013, with other studies identifying their widespread presence throughout the catchment.

White-clawed Crayfish were recorded *ca.* 3km upstream of Mallow in 2015, though none were recorded in the vicinity of Mallow during aquatic surveys for the Mallow Sewerage Scheme Upgrade Project. While less sensitive to eutrophication than salmonid species, requiring Moderate water quality conditions, they would be sensitive to more severe eutrophication impacts. As Crayfish are a qualifying interest of the SAC, this population is considered to be a KER of International Value.

The River Blackwater in the vicinity of Mallow contains excellent habitat for all life stages of Brown Trout and excellent spawning and nursery habitat for salmon, sea trout and lamprey species. Salmon, trout, lamprey and eel are protected under the Fisheries Act (1959, as amended), with salmon and lamprey additionally protected under the Habitats Directive. These species are all sensitive to eutrophication impacts. As salmon and lamprey are qualifying interests of the SAC they are considered to be KERs of International Importance. Trout and eel populations in the river are KERs evaluated as being of County Importance.

The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (*Margaritifera margaritifera*) catchment under the First Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009). Freshwater Pearl Mussel are highly sensitive to eutrophication and siltation impacts, requiring clean gravel beds with minimal silts and macrophytes. Requirements for supporting conditions are set out in the Freshwater Pearl Mussel Regulations (S.I. No 296 of 2009) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. Freshwater Pearl Mussel is a qualifying interest of the Blackwater (Munster) SAC and while the core populations are present in the Allow and Licky sub-catchments, following a legal challenge, it has been clarified that the main channel is also designated for this species. Populations potentially present in the vicinity of Mallow are therefore considered KERs of International Importance. The current WFD objective of Good status for the River Blackwater does not align, however, with the restoration of High water quality conditions required for Freshwater Pearl Mussel, and the aim should therefore be to ensure that the more stringent status is reached.

In terms of likely significant effects, the assessment in this Chapter mainly considers the KERs identified for the Project as listed in the paragraphs above, *i.e.*, those ecological receptors of local (higher) value and above. In the context of the impacts described above the assessment considers the nature of the effects that could arise and whether mitigation is required.

The waste water discharge from the upgraded WwTP, considered in relation to background pressures, meets all the relevant Surface Water Regulation EQS's for High status. Biological water quality monitoring demonstrates that the river, in the context of the current operational discharges, achieves Good status upstream and downstream of Mallow, indicating no deterioration in the longer-term quality of the benthic fauna downstream. However, localised impacts of sewer overflows could occur. The removal of 9 no. overflows and the improvements to the network will significantly reduce the volume and quality of intermittent discharges entering the river, addressing any localised impacts.

Good status conditions are sufficient to ensure that many pollution-sensitive aquatic species using the River Blackwater, including salmonids, lamprey and crayfish, are not affected by the discharges. Consequently, any less sensitive species will also remain unaffected as nutrient input *via* treated effluent from the WwTP, or diluted intermittent discharges, into the Blackwater river system would not impact water quality at a scale that would significantly affect the health, habitat or food sources of these species. Bird and mammal fauna identified as KERs, such as Kingfisher and Otter, which may rely on the river and its aquatic fauna for habitat and food, will consequently also remain unimpacted by the discharges.

The Freshwater Pearl Mussel requires High status conditions for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. The assimilative capacity calculations indicate that, under low flow conditions (worst case scenario), High status water chemistry conditions can be achieved by the discharge in the receiving waterbody, even in the context of background/upstream pressures.

It is noted that the Mallow agglomeration, prior to the upgrade being completed, was not listed as a catchment pressure on its receiving waterbody. The removal of 9 no. SWOs and the provision of appropriate treatment of Ammonia, along with the proposed ELV for Ortho-phosphate, and the proposed design and operation of the Dual Function Overflow, SW010, will cause a reduction in overall nutrient input into the river system. Locally, this will have a slight positive long-term impact on the identified KERs, *i.e.,* the river habitat, aquatic

fauna, including otter and birds that rely on the river, and together with the River Basin Management Plan (RBMP) measures tackling key pressures, this aspect of the Project will contribute towards the restoration of High status water quality conditions in the waterbody.

Given the proposed stringent ELVs and the network upgrades, the operational discharges will support the appropriate water chemistry conditions and will therefore not hinder the achievement of the Freshwater Pearl Mussel (FPM) Regulation standards for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation, and consequently not significantly affect the Freshwater Pearl Populations in the River Blackwater.

Operational discharges do not have the potential to negatively impact upon any of the habitats or fauna identified as KERs *i.e.*, the river habitat, aquatic fauna, otter or birds that rely on the river. The downstream pNHAs, which include the river habitat and its species considered herein, will also consequently remain unaffected. The AA Screening/NIS has demonstrated that the integrity of the SAC will not be affected.

As no likely significant negative effects to KERs have been identified, mitigation measures to avoid or reduce the potential impacts of the Project on KERs are therefore not required.

However, to ensure the continued satisfactory operation of the Mallow agglomeration in line with the discharge licence the author recommends the following, to:

- Ensure that the capacity of the WwTP is not exceeded;
- Ensure that all discharges continue to operate in compliance with the ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis.

As no potential significant effects have been identified from the operational discharges from the Mallow agglomeration (*i.e.*, SW001 and SW010), and no mitigation measures prescribed, there are no residual significant effects.

No cumulative effects arising with any other plans or projects are predicted.

Monitoring of effluent and the receiving watercourse is specified by the EPA discharge licence. As specified in the licence, water quality will continue to be monitored to determine the impact of the discharge from the upgraded WwTP to ensure it complies with relevant legislation and the limits specified by the licence.

In conclusion, the resultant improvement in water quality of the Blackwater River is predicted to have a slight positive long-term impact on the identified Key Environmental Receptors *i.e.,* the river habitat, aquatic sensitive water dependent fauna, otter, and birds that rely on the river. No negative effects upon Key Ecological Receptors are predicted to arise from the operational discharges associated with the Mallow agglomeration *i.e.*, SW001 and SW010. There will be no cumulative effects arising with any other plans or projects.

5. WATER

Chapter 6 of the EIAR prepared by AWN Consulting Ltd, assesses and evaluates the likely significant effects associated with the operational discharges on the water environment. An overarching component of this Chapter is assessing the impact of the operational discharges against the pertinent objectives of relevant Directives and Regulations, including but not limited to the Water Framework Directive (WFD) [2000/60/EC], UWWT

Directive [91/271/EEC] and European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2022 [S.I No. 288/2022].

A site-specific detailed WFD Screening Assessment was carried out for the operational discharges and is attached to the EIAR as **Appendix 3 – Water Framework Directive Screening Assessment.** The WFD Screening Assessment has shown that there is no potential for change in the water body status and risk as a result of the operation discharges.

The agglomeration operational discharges both enter the Blackwater (Munster)_140 waterbody directly. This waterbody is assigned Good WFD status (2013-2018 & 2016-2021). For 2013-2018, both Ammonium and Ortho-phosphate are noted as High under WFD status. There are no significant pressures identified for this waterbody.

As mentioned, the Mallow agglomeration, prior to the upgrade being completed, was not listed as a pressure on its receiving waterbody. The removal of 9 no. SWOs and the provision of appropriate treatment of Ammonia, along with the proposed ELV for Ortho-phosphate, and the proposed design and operation of the Dual Function Overflow, SW010, will result in a reduction in overall nutrient input into the river system. Given the proposed stringent ELVs and the network upgrades, the operational discharges will support the appropriate water chemistry conditions and will therefore not hinder the achievement of the FPM Regulation standards (High Status). The removal of 9 no. overflows and the improvements to the network will significantly reduce the volume and improve the quality of intermittent discharges entering the river, addressing any localised impacts.

No significant negative effects to the water environment have been identified. Mitigation measures to avoid or reduce the potential impacts of the Project on the water environment are therefore not required. As described above, a monitoring regime should be in place.

In terms of residual impacts, it is concluded that there will be no degradation of the current water body status (either chemically, ecologically or quantitatively) or its potential to meet the requirements and/or objectives and measures in the second [current] RBMP and draft third RBMP 2022-2027. It is reiterated that the Mallow agglomeration, prior to upgrade being completed, was not listed as a pressure on its receiving waterbody. The primary discharge (SW001) will be adequately treated within the WwTP. This, along with the proposed more stringent ELV for Ortho-phosphate will have a slight long-term positive impact to the WFD water quality status of the receiving watercourse.

During storm conditions, any discharges from SW010 will be diluted, settled, and screened prior to being discharged. The storm water will enter the river which will itself have increased flows driven by sustained rainfall. In this context, the discharges *via* SW010 to the large River Blackwater channel will be diluted and dispersed effectively and no long-term negative impact to the WFD water quality status of the receiving watercourse is predicted.

In terms of EOs (*via* SW010), while a theoretical risk of malfunction is possible (as the failure of any infrastructure in catastrophic situations), such scenarios are not reasonably predicted to occur. Should they occur, however, these overflows will be temporary (short-lived) and no long-term negative impact on the waterbody quality is predicted.

In summary, no potential significant negative effects have been identified from the operational discharges from the Mallow agglomeration (*i.e.*, SW001 and SW010). However, locally there will be a slight positive, long-term effect for the reasons as outlined above.

There are no cumulative impacts with other plans and projects predicted.

Monitoring of effluent and the receiving watercourse is specified by the EPA discharge licence. As specified in the licence, water quality will continue to be monitored to determine the impact of the discharge from the upgraded WwTP to ensure it complies with relevant legislation and the limits specified by the licence.

Overall, no negative effects on the water environment are predicted to arise from the operational discharges associated with the Mallow agglomeration, *i.e.,* SW001 and SW010. It is predicted that there will be a slight positive long-term effect on the receiving waterbody*, i.e*., Blackwater River, and the operational discharges will not contravene the objectives of the WFD [2000/60/EC], UWWT Directive [91/271/EEC] and European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2022 [S.I No. 288/2022].

6. POPULATION & HUMAN HEALTH

Chapter 7 of the EIAR was prepared by Enviroguide Consulting and is concerned with the likely significant effects of operational discharges on human beings, living, working, and visiting in the vicinity of the Mallow agglomeration. This Chapter details the potential direct and indirect effects of the discharges on Population and Human Health. It includes an overview of the socio-economic climate of Mallow and County Cork focusing on pertinent issues such as residential amenity, economic activity, tourism, and population levels.

In terms of the likely significant effect on Human Health and Safety, it is considered that there will be a slight, positive, long-term impact on human health, as the potential human health risks from the discharge of untreated wastewater from overflows will be reduced as a result of The Project. The increase in treatment capacity to the Mallow WwTP will contribute to protecting the local environment and public health.

In terms of the likely significant effect on Water Quality & Population, the Project will ensure compliance with the UWWT Directive. The improvement in water quality will reduce the potential for impacts from water-borne diseases and health risks. Thus, a slight, positive, long-term impact is expected on the population of Mallow due to the improved water quality resulting from the Project.

In terms of the likely significant effect on Socio Economics, as per the current situation, it is proposed that approximately 1-2 people will be employed during the operational phase of the Project having an imperceptible impact to the local economy and employment.

Noise has been assessed in **Chapter 11** and this Chapter concluded that the operational discharges will not have a significant impact in relation to Noise and vibration. As such there will be no significant impact on human health as a result of noise.

Potential odour effects have been assessed in **Chapter 12** of this EIAR whereby it was concluded that there will be no significant Odour impact as a result of the operational discharges and as such there will be no significant impact on Population and Human Health in relation to odour.

As a result of the above, no specific mitigation measures are required in relation to Population and Human Health, given the lack of direct effects resulting from the Mallow agglomeration operational discharges. However, it is noted that all workers employed with the Project will comply in full with the relevant HSE guidelines and any Government protocols that may be in place at that point in time in relation to COVID-19.

No negative residual impacts in the context of Population and Human Health are anticipated regarding the operational discharges from the Mallow agglomeration. A slight

positive impact on population and human health was identified as a result of water quality improvement.

There are no cumulative impacts with other plans and projects predicted.

In terms of Monitoring, **Section 3.5.3** of the EIAR main document has detailed general "*Measures to Prevent Unintended Discharge*".

The monitoring regime to be carried out in relation to other environmental factors, such as ecology and water will be sufficient to inform population and human health factors. No specific monitoring measures are required in relation to Population and Human Health, given the lack of direct effects resulting from the operational discharges.

7. MATERIAL ASSETS

Chapter 8 of the EIAR was prepared by Enviroguide Consulting and is concerned with the likely significant effects of operational discharges on relevant Material Assets of the Mallow agglomeration.

No protected views, rights of way or planned pieces of strategic infrastructure or any important tourist sites will be affected in any way by the Mallow agglomeration operational discharges.

Based on the subject matter of this EIAR, it is considered that there will be no significant long-term impacts on the built services and infrastructure (*e.g.,* surface water drainage, water supply, Power, Information and Communications Technology, Waste Management) as a result of Mallow agglomeration operational discharges.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Material Assets impacts are predicted from the operational discharges, SW001 & SW010.

8. TRAFFIC & TRANSPORT

Chapter 9 of the EIAR was prepared by Nicholas O'Dwyer Ltd and is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Traffic and Transportation.

Given that the Mallow WwTP and Bridge Street Pumping Station (new Pumping Station proposed on same site as current Pumping Station site) are already in operation, there will be no significant change to traffic movements on the existing network or to the existing access arrangements during their operation. The operational discharges in themselves do not generate any traffic movements.

In the absence of potential negative significant effects on the transport network and traffic itself, there is no scope for mitigation.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Traffic and Transportation impacts are predicted from the operational discharges, SW001 & SW010.

9. AIR QUALITY & CLIMATE

Chapter 10 of the EIAR prepared by AWN Consulting Ltd. is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Air Quality and Climate.

In terms of Air Quality, due to the nature of the operational discharges, there will be no air quality emissions to atmosphere associated with the discharges. Therefore, there is no predicted impact to Air Quality under normal operations.

The development will allow for an Emergency Overflow from the new Bridge Street Pumping Station (SW010). Provision for a standby power supply will be made at the new Pumping Station for continued operation of the pumping equipment in the event of an interruption to the power supply. There will be some emissions to atmosphere in relation to the back-up generators in the form of NO_2, PM and CO_2 emissions. However, emissions from the generator will have an imperceptible impact on local air quality due to only 1 no generator being required and that it will only be required for use during emergency events, which will be a very rare occurrence. It is therefore concluded that the Project will have an imperceptible impact on Air Quality.

In terms of Climate, there will be no GHG emissions associated with the operational discharges themselves. Therefore, there is no predicted impact to climate as a result of the proposal during normal operations.

Emissions of CO_2 from the back-up generator associated with SW010 are not predicted to have any significant impact to Climate. The generator will be required for use in emergency events only, which will be a very rare occurrence. Therefore, CO_2 emissions when compared to emissions targets will be imperceptible.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Air Quality and Climate impacts are predicted from the operational discharges, SW001 & SW010.

10. NOISE & VIBRATION

Chapter 11 of the EIAR, prepared by AONA Environmental Consulting Ltd. is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Noise and Vibration. This includes a brief overview of the proximity of the nearest residential properties to the operational discharges and an assessment of potential noise impacts.

The operational discharges will be completely inaudible, other than the sound of the flow of the overflow, which is akin to the sound of the existing flows in the River Blackwater. Therefore, the noise and vibration impact from the operational discharges will be negligible.

Noise emission from the back-up generator associated with SW010 (1 no. generator) are not predicted to have any significant noise impacts. The generator will be required to be used in emergency events only, when there is an interruption to the power supply for the Bridge Street Pumping Station, which will be a very rare occurrence. If the generator was required to provide power supply, its use would be expected to last a maximum of a few hours. The impact is therefore considered to be negligible.

Otherwise, occasional noise impacts may occur during maintenance of the outfall which may include occasional operation of plant and equipment to remove trapped detritus from the discharge points. It is expected that while such maintenance works may generate short-term periods with audible noise levels in the surrounding proximity, it would be expected that such maintenance works would last a maximum of a few hours and may only occur once or twice a year during the daytime period. The impact of these activities is therefore considered to be negligible.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Noise & Vibration impacts are predicted from the operational discharges, SW001 & SW010.

11. ODOUR

Chapter 12 of the EIAR, prepared by AWN Consulting Ltd, is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Odour.

The primary discharge, SW001, will be treated prior to release thereby minimising the potential for odour. In terms of SW010, a SWO event will lead to a highly diluted screened effluent being discharged to the River Blackwater. In this context, the SWO discharges will not be odorous. Any odours associated with the primary discharge and a SWO event are expected to be imperceptible.

In the highly unlikely event where the backup generator fails and where there is a prolonged power failure, and an Emergency Overflow is activated, this overflow event will be short (few hours) in duration, and it is considered that odours associated such an event will be imperceptible.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Odour impacts are predicted from the operational discharges, SW001 & SW010.

12. ARCHAEOLOGY, ARCHITECTURAL & CULTURAL HERITAGE

Chapter 13 of the EIAR, prepared by Courtney Deery Archaeological Consultants, is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Archaeology, Architectural & Cultural Heritage.

The operational discharges will take place within the existing and newly improved built infrastructure as a result of the Mallow Sewerage Scheme Upgrade Project. Due to the nature of the Project *i.e.*, operational discharges, no physical impacts are anticipated on Archaeology, Architectural & Cultural Heritage assets.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Archaeology, Architectural & Cultural Heritage impacts are predicted from the operational discharges, SW001 & SW010.

13. LAND, SOILS & GEOLOGY

Chapter 14 of the EIAR, prepared by AWN Consulting Ltd, is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Land, Soils and Geology, including Hydrogeology.

There are no sensitive soil receptors, and no identified areas of geological heritage or groundwater supplies in the vicinity of the site boundary. The closest geological heritage site is the Lady's Well in Mallow, which is an old warm spring located *ca.* 1.1km to the northwest of the subject site, across the Blackwater River.

A site-specific WFD Screening Assessment was carried out for the operational discharges and is attached as **Appendix 3 - Water Framework Directive Screening Assessment** of the main EIAR document.

Overall, this WFD Screening Assessment has shown that there is no potential for change in the groundwater water body status, and no risk as a result of the operational discharges.

Due to the nature of the operational discharges, no potential impacts to the land, soil, geological or hydrogeological environment were identified as there is no discharge to ground or active dewatering associated with the discharges.

It can be concluded that the Mallow agglomeration operational discharges, SW001 and SW010, will have an imperceptible impact on Land, Soil, and the Geological and Hydrogeological environment.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Land, Soils and Geology, including Hydrogeology impacts are predicted from the operational discharges, SW001 & SW010.

14. LANDSCAPE AND VISUAL

Chapter 14 of the EIAR, prepared by Stephenson Halliday Ltd, is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Landscape and Visual factors.

The Cork County Draft Landscape Strategy identifies the study area relating to the operational discharges as Landscape Character Area (LCA) 5: Fertile Plain with Moorland Ridge. LCA 5 is deemed to be of County importance and to have a generally very high sensitivity and very high value. It is noted that the operational discharge points are contained within a peri-urban environment and do not impinge to any great extent on the surrounding countryside.

The strategy makes the following recommendation relevant to the site:

- *Continue to promote and protect Mallow Racecourse and the River Blackwater as the primary visitor attractions in this Landscape Type.*

The operational discharge points are located within the Blackwater Corridor which is part of a High Value Landscape.

In terms of Landscape, as the operational discharge points are already present at, or very close to, the current locations, there will be no change to Land Use. Overall, it is considered that any changes to LCA 5 would be of such small scale and limited extent that they would be barely perceptible at a landscape scale. It is therefore considered that landscape effects would not be greater than negligible. It is also concluded that the scenic resource of River Blackwater would be retained intact.

In terms of the Visual aspect, the operational discharge points are located within the banks of the River Blackwater and are therefore below the general level of the surrounding landscape. In addition, the banks of the river are generally well vegetated with mature tree and shrub vegetation which screens the infrastructure from wider views. Views are therefore limited to a very local area in the vicinity of each discharge point.

The Primary discharge point, SW001, will use a previously existing outfall pipe, whilst SW010 is a new overflow within very close vicinity to the previous Bridge Street Pumping Station outfall and any changes to location and form are minimal in nature.

Views of the operational discharge points are predominantly screened by existing topography, built form and vegetation and, where they are present there would be no or very little change to views. There would therefore be minimal changes to the visual amenity of users, including those using the Blackwater corridor for recreational and amenity use. Overall, it is considered that any potential changes to visual amenity would be of such small scale and limited extent that they would be barely perceptible. It is thus considered that visual effects would not be greater than negligible.

In the absence of potential negative significant effects, no mitigation is required.

There are no residual impacts or cumulative impacts with other projects or plans predicted.

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

In summary, due to their nature, no significant Landscape and Visual impacts are predicted from the operational discharges, SW001 & SW010.

15. RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

Chapter 16 has been prepared by Nicholas O'Dwyer Ltd. and presents a consideration of risk of major accidents and/or disasters relevant to the Mallow agglomeration operational discharges (SW001 and SW010), as required in the EIA Directive, and as described in the EPA's EIAR 2022 Guidelines.

Risks were identified through a review of the EIAR environmental factor Chapters and consultation with experts, as required. As set out in the EU guidance document, risks are identified both in respect of (i) the potential vulnerability of the Project (in this case in the context of the operational discharges) to major accidents and disasters; and (ii) the potential for the Project to cause accidents and/or disasters.

Moderate risks were identified with respect to potential clogging of inlet screens without the design mechanisms in place (which would alert the system and redivert the discharge to the holding tank until the screens were unclogged). Potential damage to the biological treatment process as a result of an event whereby highly concentrated toxic influent is sent to the WwTP was also identified as a moderate risk given that it is unlikely, however, with potentially serious consequences. A fire or explosion is unlikely, however, effects could result in damage to the WwTP, as well as potential contamination of the watercourse unless runoff is contained. Potential flooding will result in a limited consequence, dilution of any untreated discharge will limit effect from contamination, with effects of a short duration.

It was concluded that the resultant risk level for the potential events relating to the operational discharges are considered to be low with all mitigation and design measures in place. These measures are already an integral part of the operational design.

IW will regularly assess the risk of major accidents and/or disasters.

16. INTERACTIONS

This Chapter of the EIAR has been prepared by Nicholas O'Dwyer Ltd. and considers the potential for interactions and inter-relationships between the factors of the environment, that have been examined individually throughout this EIAR, which could result in an impact being either positive or negative, as well as having varying levels of significance.

Biodiversity, Water and Population & Human Health are the factors identified where interaction of effects may occur as a result of the operational discharges, as summarised in **Table 16.1** below:

Table 16.1. Interactive Effects of The Operational Discharges

Operational Discharge	Environmental Factors	Summary of Effect	Further Information
SW001	Water Biodiversity Population & Human Health	The primary discharge standards will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats and designations (*e.g.*, European sites, Salmonid Water, Designated Freshwater Pearl Mussel (*Margaritifera Margaritifera*) in the wider environs or downstream of the agglomeration. The operation of the upgraded WwTP and network is expected to have a positive impact in terms of a reduction in the levels of nutrients being discharged in the Blackwater River.	Slight positive, long-term effect. Refer to **Chapters 5, 6** and **7** of the EIAR **.**

Operational Discharge	Environmental Factors	Summary of Effect	Further Information
		Improvements to water quality will have a positive impact on water based recreational activities and amenity.	
SW010	Water Biodiversity Population & Human Health	Elimination in so far as possible of unintended discharges from the agglomeration. The single SWO remaining in the upgraded sewerage network meets the required design criteria, and calculations based on network modelling indicates that this SWO would meet the UPM high-status discharge criteria for intermittent discharges. The risks of sewer or outfall failure associated with extreme events resulting in the activation of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent Emergency Overflows that can be applied have been incorporated in the design and operation of the agglomeration. The Dual Function Overflow and its operational design will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats and designations (*e.g.*, European sites, Salmonid Water, Designated Freshwater Pearl Mussel (*Margaritifera margaritifera*) in the wider environs or downstream of the agglomeration. Potential improvements to water quality and improved opportunities for water based recreational activities and amenity.	Slight positive, long-term effect. Refer to **Chapters 5, 6** and **7** of the EIAR.

17. SCHEDULE OF MITIGATION MEASURES

Following an examination, analysis, and evaluation of the direct and indirect effects of the Mallow operational discharges in each Chapter of the EIAR, it was determined that the operational discharges would have no likely significant negative effects on any environmental factors. Therefore, no project specific mitigation measures are required.

However, to ensure the satisfactory operation of the Mallow WwTW in line with the current WWDL D0052-01, and any future reviewed licence requirements, the authors of this EIAR have put forward the following recommendations to be implemented:

- Ensure that the design capacity (22,000 p.e.) of the WwTP is not exceeded;
- All flows will be monitored continuously and recorded by flowmeters at the upgraded Mallow WwTP and new Bridge Street Pumping Station;
- Ensure the primary discharge is compliant with licensed ELVs;
- Monitor the effluent discharge and ambient water quality as per Schedule A: *Discharges & Discharge Monitoring*, and Schedule B: *Ambient Monitoring* of the WWDL; and
- All workers attending the WwTP and Bridge Street Pumping Station will comply in full with the relevant HSE guidelines and any Government protocols that may be in place at that point in time in relation to COVID-19.

18. NEXT STEPS

The findings of the EIA process to date are fully documented in the EIAR accompanying the Mallow Waste Water Discharge Licence (WWDL) D0052-01 Review Application.

A copy of –

(i) The application for a waste water discharge licence review

(ii) The Environmental Impact Assessment Report (EIAR) and Natura impact Statement (NIS)

(iii) Such further information relating to the review application as may be furnished to the EPA in the course of the Agency's consideration of the application

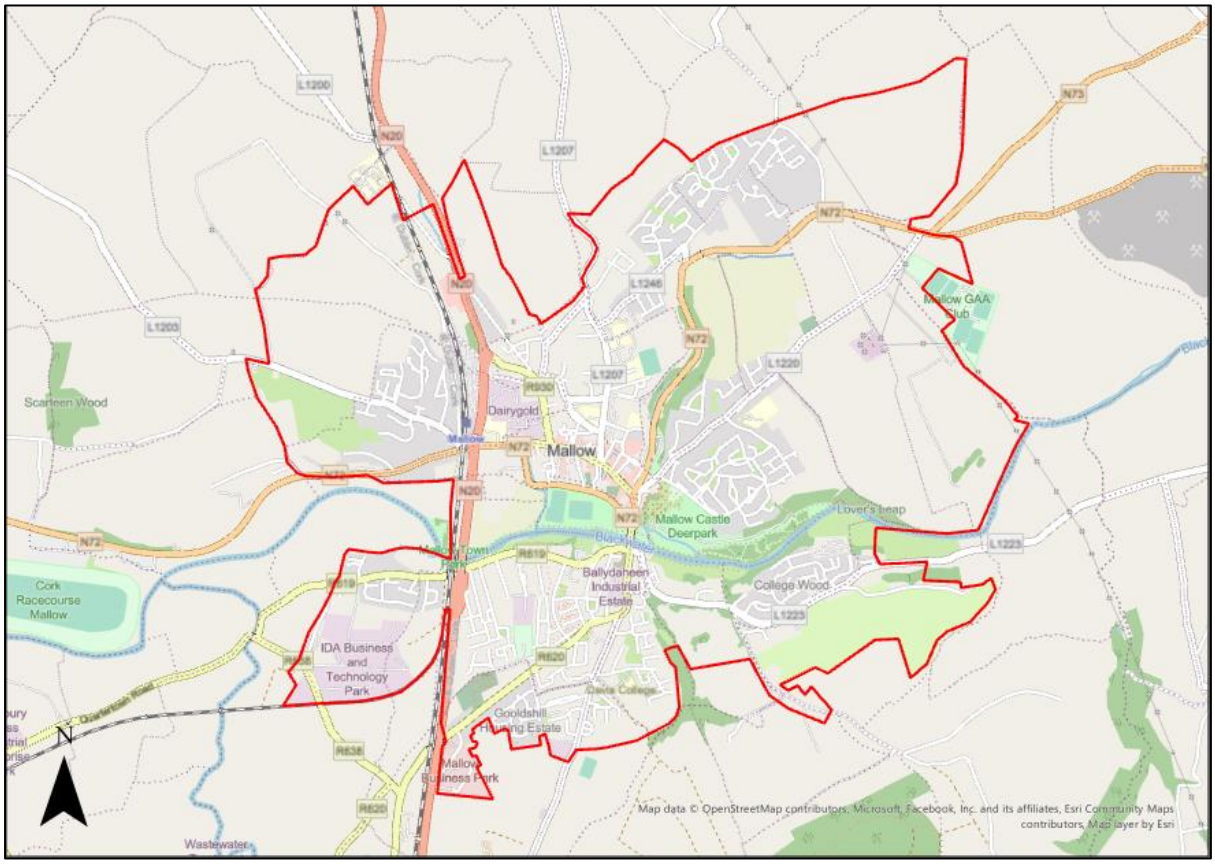
will, as soon as is practicable after receipt by the Agency of the application, be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy at the headquarters of the Environmental Protection Agency, P.O. Box 3000, Johnstown Castle Estate, Co. Wexford; at Irish Water, Colvill House, 24-26 Talbot Street, Dublin 1 and at Cork County Council, County Hall, Carrigrohane Rd, Cork.

Submissions in relation to Mallow Waste Water Discharge Licence (WWDL) D0052-01 Review Application may be made to the EPA at its headquarters at P.O. Box 3000, Johnstown Castle Estate, Co. Wexford, in writing within the period of 5 weeks beginning on the date of receipt by the EPA of the application.

Irish Water
Uisce Éireann

MALLOW WASTE WATER DISCHARGE LICENCE REVIEW – D0052-01

ENVIRONMENTAL IMPACT ASSESSMENT REPORT



NICHOLAS O'DWYER

NOVEMBER 2022

IRISH WATER

MALLOW WASTE WATER DISCHARGE LICENCE REVIEW

EIAR

Nicholas O'Dwyer Ltd.
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NOVEMBER 2022

PROJECT NO. 20893-06					
Revision	**Reason for Revision**	**Prepared by**	**Reviewed by**	**Approved by**	**Issue Date**
A	Internal Review	NOD, AWN Consulting Ltd., Thorne Ecology, Enviroguide Consulting, AONA, Courtney Deery Heritage Consultancy Ltd., Stephenson Halliday	RC/KF	KF/CAS	16/11/2022
B	Version for Client Review	NOD, AWN Consulting Ltd., Thorne Ecology, Enviroguide Consulting, AONA, Courtney Deery Heritage Consultancy Ltd., Stephenson Halliday	RC/KF	KF/CAS	19/11/2022
Final	Final for Mallow WWDA Review Application	NOD, AWN Consulting Ltd., Thorne Ecology, Enviroguide Consulting, AONA, Courtney Deery Heritage Consultancy Ltd., Stephenson Halliday	RC/KF	KF/CAS	29/11/2022

APPENDIX 2 – WASTE ASSIMILATIVE CAPACITY CALCULATONS

APPENDIX 3 – WATER FRAMEWORK DIRECTIVE SCREENING ASSESSMENT

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1. INTRODUCTION

1.1. Overview

This Environmental Impact Assessment Report (EIAR) for the Mallow agglomeration operational discharges has been prepared by Nicholas O'Dwyer Ltd. (NOD) and supporting Environmental Consultants (*i.e.*, Thorne Ecology, AWN Consulting Ltd., Enviroguide Consulting., AONA Environmental Consulting Ltd., Courtney Deery Heritage Consultancy Ltd., and Stephenson Halliday) on behalf of Irish Water (IW) in support of the Mallow Waste Water Discharge Licence (WWDL) D0052-01 Review Application.

The subject matter of the review application involves a WWDL application from a WwTP with a capacity of greater than 10,000 p.e. Therefore, a mandatory Environmental Impact Assessment Report (EIAR) is required, as per Regulation 17 of the relevant Waste Water Discharge Regulations, 2007- 2020.

1.2. Background Information

Mallow is a town in County Cork, approximately 30km north of Cork City and West of Fermoy. The town falls at the intersect of the N20 and N72. The River Blackwater runs through the town. The Mallow agglomeration is spread over 10 no. townlands namely, Mallow, Annabella, Lackanalooha, Kilknockan, Spaglen, Ballydahin, Quartertown Lower, Killetra, Gooldshill, and Carhookeal. The Waste Water Treatment Plant (WwTP) is located at NGR coordinates 157318E, 097988N on the east side of the town on the banks of the Blackwater River. The new Mallow Bridge Street Pumping Station is located at NGR 156276E, 097905N at Bearforest Lower, west of the WwTP, and also on the banks of the River Blackwater (**Figure 1.1**).

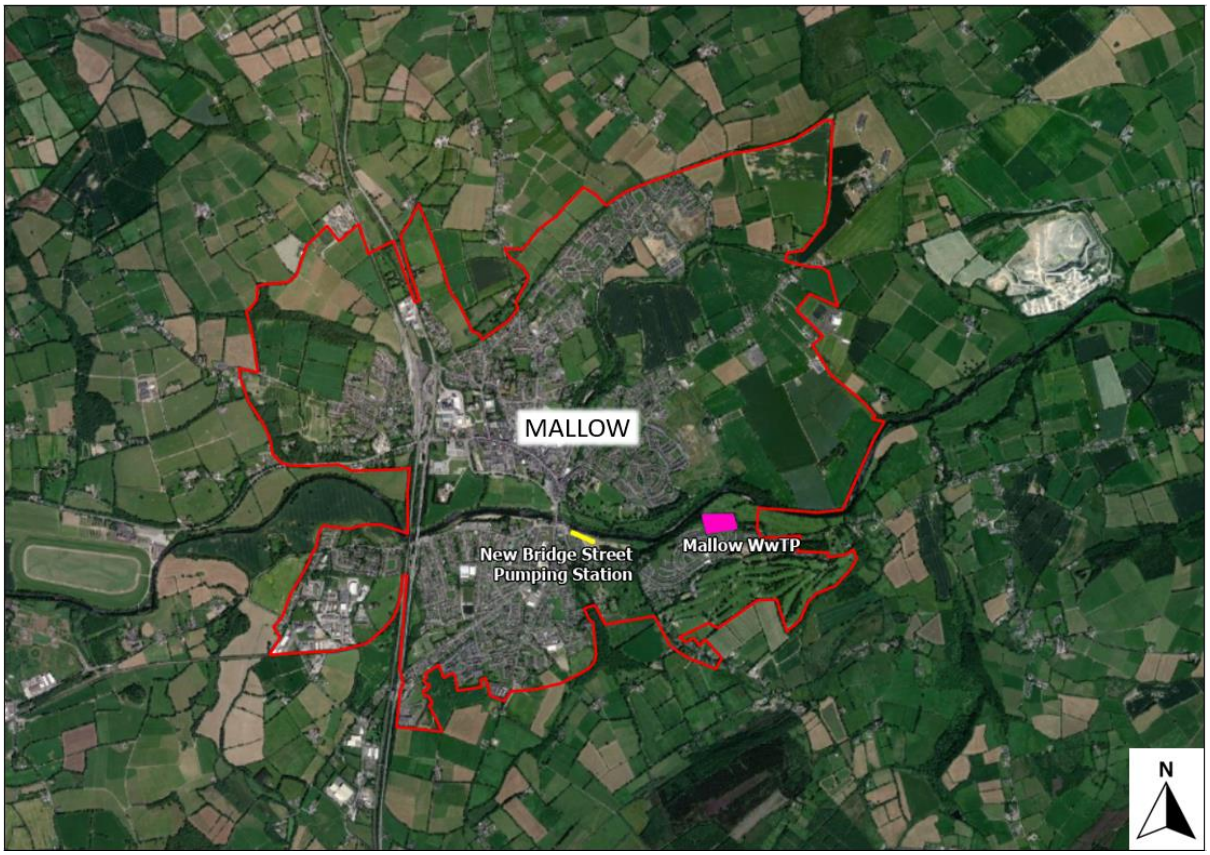

Figure 1.1 Location of Mallow Agglomeration (red line), Mallow WwTP and the New Bridge Street Pumping Station

1.2.1. Existing Waste Water Works

The Mallow agglomeration is currently served by a sewerage system which comprises mainly combined sewers in the Town Centre area, with separated foul and storm water drainage in newer developments on the outskirts of the town. A number of streets in the town have separate surface water sewers which discharge to local streams or to the River Blackwater.

The existing sewer network in Mallow contains 9 no. Storm Water Overflows (SWOs) which frequently discharge untreated waste water to the River Blackwater in the absence of any stormwater storage. The existing network is also insufficient to comply with Irish Water's design criterion for no flooding from the network in a 1:20 year return period storm event.

Mallow WwTP at Ballyellis, Mallow, has a current operational plant capacity of 10,500 p.e. There are two process streams at the plant. However, in recent years, only one process stream has been operational because major capital maintenance works are required to bring the second process stream back into operation. This would restore the operational capacity to the original design capacity of 18,000 p.e.

In its current configuration and setup, the plant is organically overloaded and cannot cater for the existing loads (current collected load (peak week) *ca.* 14,648 p.e. (2021, Annual Environmental Report, D0052-01)).

Mallow agglomeration is currently in breach of Articles 3, 4(1), 5(1) and 12 of the Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC) and as such is the subject of an infringement notice from the European Court of Justice (ECJ).

1.2.2. Mallow Sewerage Scheme Upgrade Project

In April 2019, Irish Water applied to Cork County Council Planning Authority under Section 34 of the Planning and Development Act, 2000 (as amended) for the Mallow Sewerage Scheme Upgrade Project (Ref. Planning Register Number: 195078). On 13th January 2020, Cork County Council granted approval to Irish Water for the ***Mallow Sewerage Scheme Upgrade Project*** in accordance with plans and particulars, including an Environmental Impact Assessment (EIA) Screening and Natura Impact Statement (NIS). The overall aim of the Scheme is to rectify the issues described in **Section 1.2.1** and to ensure compliance with D0052-01. The Mallow Sewerage Upgrade Scheme includes the following elements of work:

- Removal of 8 no. existing SWOs as per D0052-01, and 1 no. unlicensed SWO at Quarterstown;
- Increase the capacity of the network to convey a 1:20 year return period storm for the 30-year design horizon without causing flooding;
- A new pumping station to replace the existing Bridge Street Pumping Station at Bearforest Lower;
- Provision of a Stormwater Storage Tank (2,400m^3) at the Bridge Street Pumping Station and interconnecting pipework and overflow to the River Blackwater (Overflow NGR 156636E, 097862N). The SWO at the new Pumping Station (*i.e.*, SW010 at NGR 156636E, 097862N) has been designed to operate to meet the definition of '*Storm Water Overflow'* as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007 to 2020 and the criteria as set out in the Department of Housing, Local Government and Heritage (DoEHLG) '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995;

- Provision of additional forward pumping capacity to the WwTP. Forward flow to the WwTP from new Bridge Street Pumping Station will be limited to three times Dry Weather Flow (DWF). Flows in excess of 3DWF will spill into the storm sump at the Pumping Station and will then be pumped to the new storm tank;
- Replacement sewers on the foul/combined sewer network in Mallow to provide for increased flows arising from elimination of SWOs on the network and to cater for future development growth in the agglomeration;
- New rising mains to connect this pumping station to the sewer network at Cois na hAbhainn, Ballyellis;
- An increase in treatment capacity at Mallow WwTP to 22,000 p.e;
- Upgrade of sludge import facilities at Mallow WwTP to provide for sludge import volumes in line with IW's National Wastewater Sludge Management Plan;
- Provision for a standby power supply will be made at the Mallow WwTP to provide for continued operation of the waste water treatment equipment in the event of an interruption in the power supply; and
- Provision for a standby power supply will be made at Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. The changeover of the power supply is dependent on the Electricity Supply Board (ESB) attending to manually changeover the supply. In the unlikely event of a power outage occurring for a prolonged period, the waste water will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater River *via* an Emergency Overflow (EO), SW010 at NGR 156636E, 097862N.

The Mallow Sewerage Scheme Upgrade Project is included on Irish Water's current Capital Investment Plan. The Networks Upgrade Contract commenced on site in April 2021 and works are ongoing with an estimated completion date of January 2023. The Mallow WwTP Upgrade and new Bridge Street Pumping Station Contract commenced in May 2021 and works are ongoing with an estimated completion date of December 2023.

1.2.3. Scope of the EIAR

The EIAR being submitted with this Waste Water Discharge Authorisation (WWDA) Review Application considers the impact of the operational discharges associated with the Mallow agglomeration after the completion of the Mallow Sewerage Scheme Upgrade Project. It does not assess the impacts associated with the construction of the Mallow Sewerage Scheme Upgrade Project which has already received planning permission (Cork County Council Planning Reg No. 19/05078.

The scope of the EIAR comprises the operational discharges associated with the Mallow WWDA D0052-01 Review Application and is henceforth referred to as "*the Project".* A description of the Project for the Mallow WWDA D0052-01 Review is provided in **Chapter 3.**

1.2.4. Need for D0052-01 WWDA Review

Following an examination of the Mallow WWDA in June 2021, the Environmental Protection Agency (EPA) concluded that the WWDA does not satisfy the environmental requirements of the WWDA, 2007 regulations, as amended. The reasoning for their

conclusion and recommendation for a review of the current WWDA D0052-01 was based on the following:

1. The licence was granted over 3 years ago.
2. Planning permission has been granted for proposed development works associated with the licence.
3. The agglomeration is included in Irish Water's investment plan.
4. Non-compliance with:
   - Upgrade of the sewerage network, as set out in Schedule C: Specified Improvement Programme, by 01/06/2016;
   - Installation of a Pumping Station overflow holding tank, as set out in Schedule C: Specified Improvement Programme, by 01/06/2016; and
   - Discontinuation of SWO discharges, as set out in Schedule C: Specified Improvement Programme, of this licence, by 01/06/2016.

Along with the above, this WWDA review relates to the following:

- An increase in treatment capacity at Mallow WwTP to 22,000 p.e.
- Amendment to the agglomeration boundary.
- Inclusion of an additional SWO discharge location (SW010).

1.3. EIA Team

Article 5(3)(a) of the amended EIA Directive (2014/52/EU) (EIA Directive) states that *"the developer shall ensure that the environmental impact assessment report is prepared by competent experts"*. The Guidelines on the Information to be contained in Environmental Impact Assessment Reports issued by the Environmental Protection Agency (EPA) in May 2022 highlights the need for competent experts to be involved in the EIA process and in the preparation of the EIAR.

Working closely with the IW WWDA Specialist, Environmental Specialists from NOD coordinated and managed the preparation of this EIAR and led a team of competent experts in the preparation of the EIAR specialist chapters. Each contributing expert provides a statement of authority, and an explanation of the methods of data collection and assessments that were carried out with reference to applicable discipline or industry standards and government guidance.

Table 1.1 lists the competent experts who were involved in the preparation of each Chapter of the EIAR.

Table 1.1:EIA Chapters and Competent Experts

EIA Chapter	Company	Name & Qualifications
Chapter 1 - Introduction	Nicholas O'Dwyer Ltd.	Krista Farrugia, Principal EIA Consultant, BSc, MSc, PgDip, PIEMA
Chapter 2 - The EIA Process		
Chapter 3 - Description of the Project and Site		

EIA Chapter	Company	Name & Qualifications
Chapter 4 – Policy & Legislative Context		Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 5 - Biodiversity	Thorne Ecology	Kate Harrington, Principal Ecologist, MSc, MCIEEM
Chapter 6 - Water	AWN Consulting Ltd.	Teri Hayes, Director, BSc MSc PGeol EurGeol
Chapter 7 - Population & Human Health	Enviroguide Consulting	Janet O'Shea, Technical Director, BSc, IEMA, MCIWM, C. Env
Chapter 8 - Material Assets	Enviroguide Consulting	Charlotte Lawler-Greene, Principal Environmental Consultant, BSc, MSc
Chapter 9 - Traffic and Transport	Nicholas O'Dwyer Ltd.	Graham Young, Nicholas O' Dwyer Ltd., Senior Engineer, CEng, Dip. PM, BA BAI
Chapter 10 - Air Quality and Climate	AWN Consulting Ltd.	Ciara Nolan, Senior Air Quality Consultant, MSc, BSc, AMIAQM, AMIEnvSc
Chapter 11 - Noise and Vibration	AONA Environmental Consulting Ltd.	Mervyn Keegan, Director, MSc, BSc, MIAQM, MIOA
Chapter 12 - Odour	AWN Consulting Ltd.	Ciara Nolan, Senior Air Quality Consultant, MSc, BSc, AMIAQM, AMIEnvSc
Chapter 13 - Archaeology, Architectural and Cultural Heritage	Courtney Deery Heritage Consultancy Ltd.	Lisa Courtney, Director, BA, MSc, IAI, ICOMOS
Chapter 14 - Lands, Soils and Geology	AWN Consulting Ltd.	Teri Hayes, Director, BSc MSc PGeol EurGeol
Chapter 15 - Landscape and Visual	Stephenson Halliday	Daniel Leaver, Associate Director, BSc, MSc, CMLI
Chapter 16 - Risk of Major Accidents and/or Disasters	Nicholas O'Dwyer Ltd.	Krista Farrugia, Principal EIA Consultant, Nicholas O' Dwyer Ltd., BSc, MSc, PgDip, PIEMA
Chapter 17 - Interactions	Nicholas O'Dwyer Ltd.	Krista Farrugia, Principal EIA Consultant, Nicholas O' Dwyer Ltd., BSc, MSc, PgDip, PIEMA

EIA Chapter	Company	Name & Qualifications
		Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 18 – Schedule of Mitigation Measures	Nicholas O'Dwyer Ltd.	Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 19 - Bibliography	Nicholas O'Dwyer Ltd.	Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc
Chapter 20 – Abbreviations	Nicholas O'Dwyer Ltd.	Robbie Clarke, Environmental Consultant, Nicholas O' Dwyer Ltd., BSc, MSc

In addition to the main contributors to the EIAR, information on the contents of this EIAR was sought from relevant stakeholders in an EIA scoping consultation process. The findings from the scoping process are presented in **Section 2.3** below.

1.3.1. Difficulties Encountered

No difficulties were encountered during the preparation of this EIAR.

2. THE EIA PROCESS

2.1. General

The process by which the likely significant effects of a project on the environment are assessed is set out in the EU EIA Directive 2011/92/EU on the assessment of the effect of certain public and private projects on the environment (codification) (transposed to Irish law through the Planning and Development Regulations 2001, as amended), as amended by EIA Directive 2014/52/EU (transposed to Irish law through the European Union (Planning and Development) (Environmental Impact Assessment) Regulations S.I. 296 of 2018 and in terms of Waste Water Discharges in S.I. No. 214 of 2020 - European Union (Waste Water Discharge) Regulations 2020.

The EIA process includes a number of key characteristics:

- It is systematic, comprising a sequence of tasks defined both by regulation and by practice;
- It is analytical, requiring the application of specialist skills from the environmental sciences;
- It is impartial, its aim being to inform the decision-makers;
- It is consultative, with provision being made for obtaining feedback from interested parties, including local authorities and statutory agencies; and
- It is interactive, allowing opportunities for environmental concerns to be addressed during the planning, design, and implementation of a project.

The structure and general sequence of this EIAR follows the EPA Guidelines (2022), as illustrated in **Figure 2.1** below. The process may be summarised succinctly as follows:

1. Screening – Is EIA Required?
2. Scoping – If EIA is Required, what aspects of the Environment should be considered?
3. Preparation of EIAR

The EIAR informs the EIA process being conducted by the Competent Authority (CA), which in this case is the EPA as part of the WWDA process.

2.1.1. EIA Directive, Legislation and Guidelines

The development of this EIAR has been informed by the EIA Directive (2014/52/EU), National Legislation, EU and EPA guidelines and other guidelines and circulars.

This EIAR adheres to the fundamental principles of the EIA process as outlined in the EU Guidelines (2017) and EPA Guidelines (2022). The Guidelines set out the matters that must be addressed in an EIAR which include:

- Anticipating, avoiding and reducing significant effects;
- Assessing and mitigating effects;
- Maintaining objectivity;
- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating consultation.

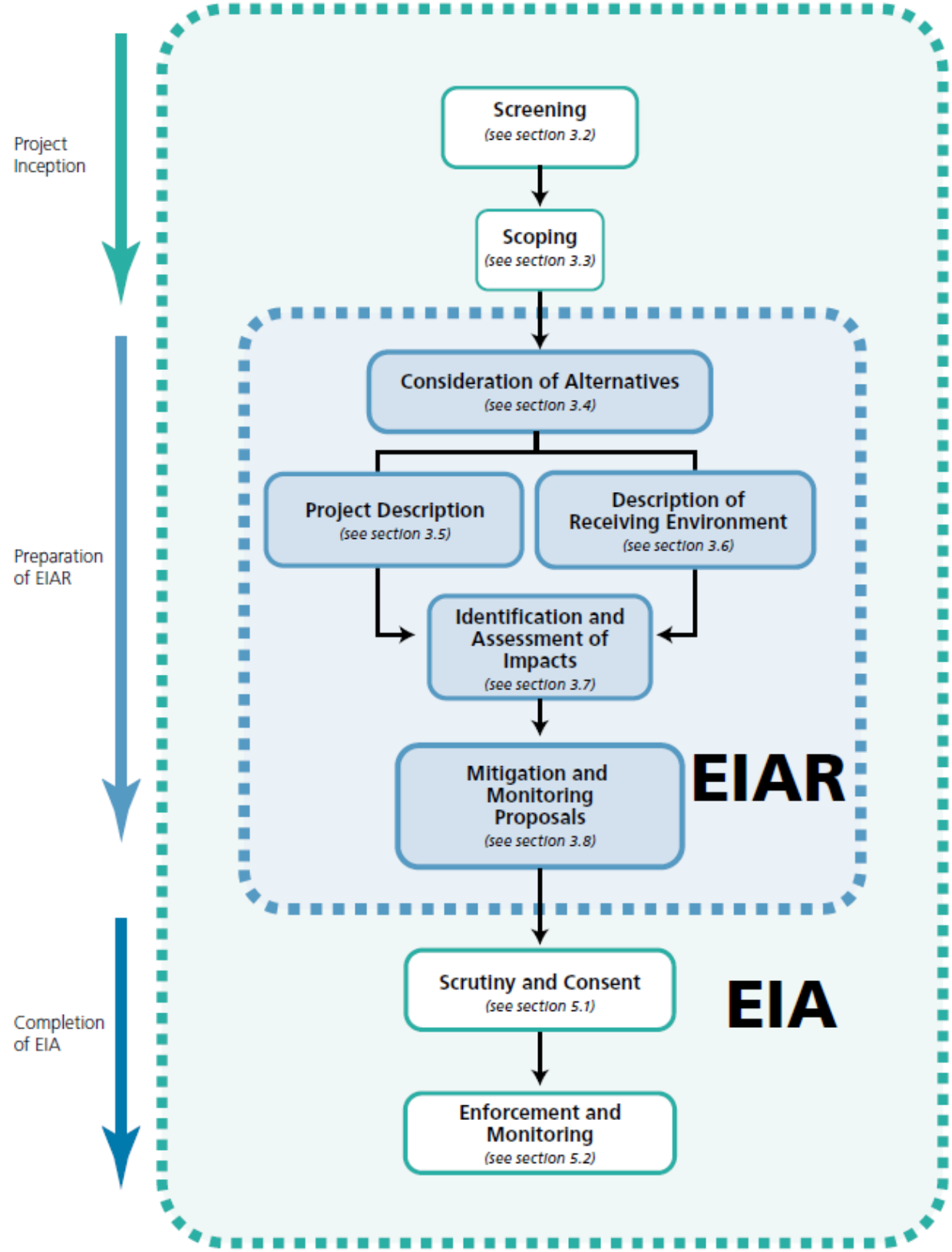

Figure 2.1. The Position of The EIAR Within the EIA Process[1]

[1] *Environmental Protection Agency, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, May 2022, https://bit.ly/3SUhQCY , [accessed 01/11/2022].*

2.2. EIA Screening

The project has been screened against Regulation 17 of the Waste Water Discharge Regulations (S.I. No. 214/2020) which state the following: -

> *'17. The principal Regulations are amended by substituting the following Regulation for Regulation 17 –*
>
> *"Certain applications to be accompanied by an EIAR*
>
> *17. An application in respect of the waste water discharge from—*
>
> *(i) a waste water treatment plant with a capacity of greater than 10,000 population equivalent as defined in Article 2, point (6), of the Urban Waste Water Treatment Directive, and*
>
> *(ii) a waste water treatment plant specified in accordance with paragraph (6)(c) or (8)(b)(ii) of Regulation 18 or paragraph (3)(c) or (5)(b)(ii) of Regulation 25,*
>
> *shall, subject to and in addition to compliance with the requirements of Regulation 16, be accompanied by a copy of an EIAR, which shall be submitted in electronic form (which shall be searchable by electronic means as far as practicable) and such other form as may be specified by the Agency".*

The project involves a WWDA application for a Waste Water Treatment Plant (WwTP) with a capacity of greater than 10,000 population equivalents as defined in Article 2, point (6), of the Urban Waste Water Treatment Directive (UWWT). Therefore, a mandatory EIA, and the preparation of an EIAR is required for this Project to inform the WWDA process.

2.3. EIA Scoping Process

The scoping stage of the EIA is a process of determining the content and extent of the matters which should be covered in the environmental information to be assessed in the EIAR.

The EPA (2022) document *'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* states that *'All parties should be aware of the need to keep the EIAR as tightly focussed as possible. This focusses the effort and resources of all parties on the key significant issues. Scoping is usually guided by the following criteria: -*

- *Use 'Likely' and 'Significant' as the principal criteria for determining what should be addressed. Any issues that do not pass this test should be omitted (scoped out) from further assessment. A section of the EIAR should describe the scoping process explaining why such issues have been scoped out and they are not being considered further. All the prescribed environmental factors need to be listed in the scoping section of the EIAR. It is important to note that the environmental factors themselves cannot be scoped out and must feature in the EIAR. Only topics and headings related to each factor can be scoped in or out. Each environmental factor should be clearly covered by one or more specific section headings in the EIAR. If scoping determines that no likely significant issues arise under any heading, then an explanatory text should be included;*

- *Precedence - where EIARs for similar projects on similar sites or for other project proposals for the same site are available, these can be useful references; and,*
- *Interactions – assessors need to be vigilant for pathways – direct and indirect – that can magnify effects through the interaction or accumulation of effects – for instance the potential for cumulative significant effects to arise from multiple non-significant impacts.*

It is important to reiterate that the scope of this EIA relates solely to the operational discharges from the Mallow agglomeration, as detailed in **Section 1.2.3** and **Chapter 3**.

This EIAR identifies, describes, and assesses in an appropriate manner the direct and indirect potential significant effects of the operational discharges from Mallow agglomeration on each of the factors listed in Article 3 of Directive 2011/92/EU as amended by Directive 2014/52/EU as below:

> '*Article 3*
>
> *1. The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> *(a) population and human health;*
>
> *(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
>
> *(c) land, soil, water, air and climate;*
>
> *(d) material assets, cultural heritage and the landscape;*
>
> *(e) the interaction between the factors referred to in points (a) to (d).*
>
> *2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned".*

The EIAR includes an assessment of the discharges from the agglomeration (*i.e.*, Primary Discharge (SW001) from the WwTP and Dual Function Overflow (SW010) from the new Bridge Street Pumping Station) to the receiving water *i.e.,* River Blackwater.

2.3.1. Scoping Report

Nicholas O' Dwyer Ltd., on behalf of IW, prepared a Scoping Report describing the nature of the operational discharges from the Mallow agglomeration, the need for the project, and for each environmental factor as listed in the EIA Directive, the baseline environment, proposed assessment methodology and potential significant impacts.

On 30th August 2022, in accordance with Regulation 17C of the European Union (Waste Water Discharge) Regulations 2007 to 2020, Irish Water submitted an EIA Scoping Report to the EPA with a request for the Agency to provide its opinion in writing on the scope and level of detail of the information required to be included in the EIAR.

In accordance with the requirements of Regulation 17C & 17D of the European Union (Waste Water Discharge) Regulations 2007 to 2020 (hereafter referred to as WWD Regulations), the Agency consulted with the below listed bodies on 31st August 2022 who were advised that a submission in relation to the information to be contained in the EIAR may be made to the Agency within four weeks beginning on the date of the notice:

- Minister for Agriculture, Food and the Marine;

- Inland Fisheries Ireland;
- Development Applications Unit (Department of Housing, Local Government and Heritage);
- An Taisce;
- Health Service Executive;
- Health and Safety Authority;
- Fáilte Ireland;
- An Bord Pleanála; and
- Cork County Council (Planning Section and Environment Section)

A summary of the comments and recommendations received from the agencies and organisations has been provided below.

2.3.2. Scoping Response

Cork County Council was the only consultee to provide a response, which is provided below:

- *The proposed operational discharges will discharge in the Blackwater (Munster)_130 and Blackwater (Munster)_140, both of which have a WFD 2013-2018 designation of "GOOD" status. The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (*Margaritifera margaritifera*) catchment under the First Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) and is also a Special Area of Conservation designated for the protection of a range of freshwater species and habitats. The EPA as competent authority to confirm through the EIA and AA processes that licence emission limit values are established at limits which can ensure that Ecological Quality Objectives as set out in the fourth schedule of the FWPM Regulations can be maintained, and that the Conservation Objectives for all qualifying interests of the Special Area of Conservation are also met.*
- *EPA to review EIAR scoping conclusion that there is no potential in relation to Air Quality, particularly odour, and verify rational used was appropriate.*

The scoping response received from Cork County Council was taken into consideration when preparing this EIAR, particularly in relation to **Chapter 5 – Biodiversity, Chapter – 6 Water** and **Chapter 12 – Odour.**

2.3.3. Scoping Opinion

In relation to the information in paragraph 2 of Schedule 6 to the Planning and Development Regulations of 2001, as amended, and having regard to the specific characteristics of the project, including location and technical capacity, and likely impact on the environment, the EPA provided the following opinion:

(i) identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of a project on each of the factors listed in Article 3 of Directive 2011/92/EU as amended by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive). It is important to note that the environmental factors themselves cannot be scoped out and must feature in

the EIAR. Only subtopics and headings related to each factor can be scoped in or out. Each environmental factor should be clearly covered by one or more specific section headings in the EIAR. If scoping determines that no likely significant issues arise under any heading, then an explanatory text should be included;

(ii) address the matters raised in the responses received from the bodies detailed above;

(iii) address the requirements of Regulation 17A of the WWD Regulations;

(iv) address compliance with the requirements of the Urban Waste Water Treatment Directive and Water Framework Directive including the programme of measures;

(v) include an assessment of all discharges from the wastewater works (primary, storm water overflow and emergency overflows) including a cumulative assessment that demonstrates that the project aims to achieve the Water Framework Directive environmental objectives for the receiving waters including objectives and standards for associated protected areas;

(vi) address monitoring of waste water discharges and the receiving water;

(vii) have regard to the EPA's Guidelines on the information to be contained in Environmental Impact Assessment Reports

(viii) have regard to the relevant topics contained in the EPA's Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) September 2003;

(ix) satisfy the requirements of the EIA Directive.

All of the points listed above were taken into consideration throughout the process of preparing this EIAR.

2.4. EIAR Structure

The composition of this EIAR is in accordance with EPA Guidelines (2022) which requires that information contained within an EIAR should be in accordance with Article 3(1), Article 5(1) and any additional information specified under Annex IV under the Directive 2014/52/EU.

This EIAR has been prepared with consideration of the EPA's "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"* (May 2022), and the *"Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment",* Department of Housing, Planning and Local Government (August 2018).

The EIAR is presented in the format set out in the EPA's "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"* (May 2022). It is presented as follows:

Non-Technical Summary provides a non-technical summary of the EIAR laid out in a similar, but condensed, format to the main EIAR.

Main Report of the EIAR, provides a general introduction and background to the project, describes the EIA process, provides a project description, including alternatives considered, and policy and legislative context (**Chapters 1 to 4**). **Chapters 5 to 15**

describe the potential environmental impacts of The Project in relation to each environmental factor. **Chapter 16** assesses risks of major accidents and/or disasters. **Chapters 17** is a summary of how the different environmental effects interact and **Chapter 18** provides a schedule of mitigation measures, representing the environmental commitments associated with the operational discharges from the agglomeration. A Bibliography is provided in **Chapter 19** and Abbreviations are presented in **Chapter 20**.

- Chapter 1 - Introduction
- Chapter 2 – The EIA Process
- Chapter 3 - Description of the Project and Site
- Chapter 4 – Policy & Legislative Context
- Chapter 5 - Biodiversity
- Chapter 6 - Water
- Chapter 7 – Population & Human Health
- Chapter 8 - Material Assets
- Chapter 9 – Traffic and Transportation
- Chapter 10 - Air Quality and Climate Change
- Chapter 11 - Noise and Vibration
- Chapter 12 – Odour
- Chapter 13 - Archaeology, Architectural and Cultural Heritage
- Chapter 14 – Lands, Soils and Geology
- Chapter 15 - Landscape & Visual
- Chapter 16 – Risk of Major Accidents and/or Disasters
- Chapter 17 – Interactions
- Chapter 18 – Schedule of Mitigation Measures
- Chapter 19 – Bibliography
- Chapter 20 – Abbreviations
- Appendix 1 – Criteria for Rating Site Attributes – Estimation of Importance of Hydrology Attributes
- Appendix 2 – Waste Assimilative Capacity Calculations
- Appendix 3 – Water Framework Directive Assessment

2.4.1. Environmental Factors Chapter Layout

Each Environmental Factor Chapter contained within this EIAR has been structured according to EPA Guidelines (2022) and is generally structured as outlined below.

2.4.1.1. Introduction

This section will introduce the environmental factor to be assessed and the areas to be examined in the assessment.

2.4.1.2. Methodology

This section will contain the specific topic related methodologies. This will include the methodology and raw data used in describing the existing environment and undertaking the impact assessment.

2.4.1.3. Receiving Environment

An accurate description of the existing baseline environment is necessary to predict the likely significant impacts of a proposed development. To describe the existing environment, desktop reviews of existing data sources were undertaken for each specialist area, as required. The literature review includes published reference reports and datasets. Desktop studies, as required, were supplemented by specialised field surveys to confirm the accuracy of the desktop study or to gather further, site-specific baseline environmental information. The sensitivity of the environment to the operational discharges is also described and sensitive receptors identified as relevant.

2.4.1.4. Description of Likely Significant Effects

This section predicts how the receiving environment will be impacted by the operational discharges and describes the potential significance of the impact.

2.4.1.5. Mitigation Measures

This section provides the recommendations for mitigation measures to reduce or eliminate any significant negative impacts identified.

2.4.1.6. Residual Impacts

This section describes the assessment of the specific direct and indirect impacts of the operational discharges. Residual Impacts are predicted impacts remaining after mitigation measures have been applied. The predicted impacts are discussed having regard to their character, magnitude, duration, consequences, and significance, and also their cumulative impacts.

Table 2.1 below outlines the approach to describing environmental impacts and effects in this EIAR. This methodology follows that set out in the EPA guidelines (2022). In the context of Water (hydrology), Transport Infrastructure Ireland (TII) criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes during the EIA stage are also relevant in assessing the impact and are presented in **Appendix 1**.

2.4.1.7. Monitoring

This section provides a description of any proposed project monitoring of effects on the environment which might be deemed necessary.

2.4.2. Risk of Major Accidents and/or Disasters

This Chapter of the EIAR identifies how the potential for accidents and disasters relevant to the operational discharges have been identified and how those risks have been managed. This is in accordance with Article 3(2) of the EIA Directive, which states:

"The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned".

The Risk of Major Accidents and/or disasters is outlined in **Chapter 16** of this EIAR.

2.4.3. Environmental Interactions

This Chapter of the EIAR covers the interactions between each of the environmental factors covered in **Chapters 5** to **15** of the EIAR. This Section is directed by Article 3(1)(g) of the EIA Directive 2014/52/EU, which requires "*the interaction between the factors referred to in points (a) to (d)*".

2.4.4. Schedule of Mitigation Measures

This Chapter of the EIAR summarises the mitigation measures that have been identified in the individual sections. These include mitigation measures that are incorporated into the design of the discharges and any measures taken to prevent discharges from polluting the receiving waterbody. The Schedule of Mitigation Measures is outlined in **Chapter 18** of this EIAR. A summary of recommendations is also provided in this Chapter.

2.5. Assessment of Impacts

The purpose of this EIAR is to present an assessment of the likely significant effects of the Project (*i.e.*, the operational discharges SW001 and SW010) on the environment. This will inform the EPA's assessment process on whether to grant consent for a WWDA review for the Mallow agglomeration and will assist the EPA in identifying conditions that may be attached to the licence. The type and characteristics of the impacts are set out in Annex III(3) and Annex IV(5) of the EIA Directive.

Table 2. below outlines the approach to describing environmental impacts and effects in this EIAR. This methodology follows that set out in the EPA guidelines (2022).

Table 2.1 Description of Effects. Source: EPA Guidelines (2022)

Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral.	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see *Determining Significance*).	**Imperceptible** An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Momentary Effects** Effects lasting from seconds to minutes.
	Brief Effects Effects lasting less than a day.
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

3. DESCRIPTION OF PROJECT AND SITE

3.1. Characteristics of the Existing Environment

The subject matter of this EIAR comprises the operational discharge activities from the Mallow agglomeration after the completion of the Mallow Sewerage Scheme Upgrade Project. Therefore, this document is only concerned with the likely significant effects on the receiving environment associated with the operational discharges from the agglomeration.

There are several environmental receptors associated with the proposed operational discharge activities that are taken into consideration as part of the EIAR process. These include, but are not limited to the following designated features:

- A European Site within the immediate zone of influence of the project *i.e.,* Blackwater River (Cork/Waterford) SAC (Site code: 002170). Further downstream of the operational discharges (*ca.* 27km), the next closest European site is the Blackwater Callows SPA (Site code: 004094);
- The River Blackwater (Munster), designated as a Freshwater Pearl Mussel (*Margaritifera margaritifera*) site list under the first Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009);
- There are no pNHAs in the immediate vicinity of the operational discharges. The nearest pNHAs downstream of the operational primary discharges and that have water dependent features are the following:
  - Blackwater Valley (Killavullen) – *ca.* 12km downstream of Mallow along the River Blackwater
  - Blackwater Valley (Ballincurrig Wood) – *ca.* 15km downstream of Mallow along the River Blackwater
- The Blackwater River is designated as a Salmonid River (Blackwater [Munster]) under the Salmonid River Regs (S.I. No. 293 of 1988);
- The Blackwater (Munster)_140 is designated as a nutrient sensitive area in accordance with the UWWT Directive 91/271/EEC on Urban Waste Water Treatment and S.I. No. 254 of 2001, S.I. No. 440 of 2004 and S.I. No. 48 of 2010, with P being the limiting nutrient in this waterbody.
- The proposed operational discharges will discharge into the Blackwater (Munster)_130 and Blackwater (Munster)_140, both of which have a WFD 2013-2018 and 2016-2021 designation of Good status. Approximately 0.7km downstream of the discharge point the Blackwater (Munster)_140 flows into the Blackwater (Munster)_150 which is classed as Good status, before flowing into the Blackwater (Munster)_160 *ca.* 2.5km downstream, where it is classed as Moderate status.

Figure 3.1 for map shows key receptors and sensitivities.

This EIAR, has been prepared in accordance with Directive 2011/92/EU, as amended by Directive 2014/52/EU (the EIA Directive) and S.I. No. 214 of 2020 - European Union (Waste Water Discharge) Regulations 2020, and assesses the likely significant effects on the environment from the operational discharges on the identified receptors, alone and in combination with other plans and projects.

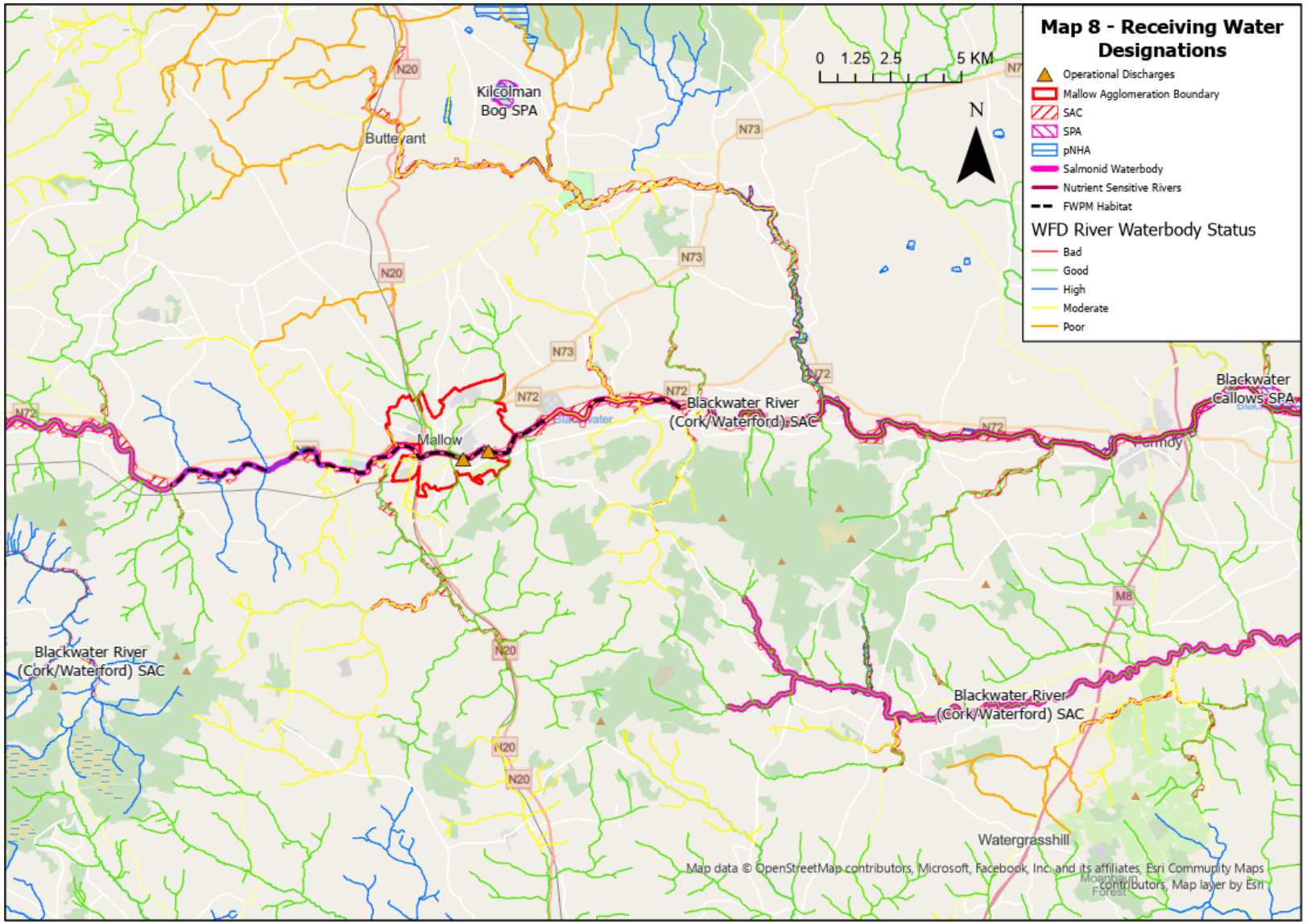

Figure 3.1 Key Receptors and Sensitivities in Relation to the Mallow Agglomeration & Associated Operational Discharges

3.2. Consideration of Alternatives

Article 5 of the amended EU EIA Directive 2011/92/EU requires that the EIAR shall contain *"a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."* Per Annex IV of the amended Directive, information in the EIAR should include a description of the reasonable alternatives relevant for the project in terms of design, technology, location, size and scale; and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

3.2.1. "*Do Nothing*" Scenario

In the absence of the Mallow Sewerage Scheme Upgrade Project, there is the possibility that there would be inadequate treatment capacity within the treatment plant to meet the needs of the area served. It is likely that there would be an increase in discharges of untreated waste water to the Blackwater River during storm events. This would result in ineffective management of the waste water treatment process and risks to the environment and public health. It is therefore considered that the "*Do-Nothing*" scenario is not an option.

A Type II Hydraulic Model of the sewer network (as defined in the WaPUG) Code of Practice) was built by T.J. O'Connor & Associates in April 2019 using Infoworks ICM according to Irish Water's Wastewater Network Hydraulic Model Build and Verification Standard. This model was verified using Flow and Load Rainfall Surveys and Impermeable Area Surveys to confirm that the existing model is an accurate representation of the existing network.

The results of the analysis for the "*Current Conditions with No Upgrades*" scenario show that 199 pipes are surcharged and 33 manhole nodes are flooded (in excess of $25m^3$). Under the "*Future Conditions with No Upgrades*" scenario the results show that 202 pipes are surcharged and 34 manholes are flooded (in excess of $25m^3$).

If the Mallow Sewerage Scheme network upgrades are not completed, the possibility of future flood events on the network would continue and likely increase. Climate change is already resulting in more intense storms and rainfall events and there is an increased likelihood and magnitude of river and coastal flooding in the future. This will have economic and social impacts on businesses, residents, public infrastructure, and services that have been affected by previous flood events. It is therefore considered that the "*Do-Nothing*" scenario is not an option.

3.2.2. Alternative Locations

The proposed development at Mallow WwTP is required to provide for an increase in treatment capacity to 22,000 p.e. The option of providing this additional treatment capacity in a separate treatment facility located elsewhere in the catchment is not realistic, given the configuration of the sewer network in Mallow, and the degree to which spare capacity in some of the existing treatment units can be utilised.

The removal of SWOs on the sewer network in Mallow town will result in increased flows arriving at the Bridge Street Pumping Station, necessitating the provision of the new Pumping Station and stormwater holding tank.

3.3. Project Description: Operational Discharges

Chapter 1 of this EIAR provides details on the background and a description of the existing Mallow WwTP and the upgrades to the WwTP and Network under the Mallow Sewerage Scheme Upgrade Project. This section provides details on the operational discharges of the Mallow agglomeration *i.e.*, the subject matter of this EIAR. **Figure 3.2** Mallow Wastewater Treatment Plant Layout shows the layout plan of the WwTP.

3.3.1. Primary Discharge (SW001)

The primary discharge (SW001) from the upgraded WwTP will remain the same as it was prior to the Mallow Sewerage Scheme Upgrade Project and will continue to discharge to the Blackwater River at NGR 157530E, 098140N.

The location of the Primary Discharge (SW001) is shown in **Table 3.1** and on **Figure 3.2** and **Figure 3.3.**

The Mallow Sewerage Scheme Upgrade Project will increase the capacity of the WwTP to 22,000 p.e. and will result in a greater volume of wastewater in the agglomeration receiving treatment prior to the discharge of the treated effluent to the River Blackwater in accordance with the EPA WWDL standards.

3.3.2. Dual Function Overflow (SW010) at Bridge Street Pumping Station

There will be a single Dual Function Overflow (SW010) at the new Bridge Street Pumping Station *i.e.,* an overflow which can act as a SWO or as an EO depending on the event. The location of the Dual Function Overflow (SW010) is shown in **Table 3.1** and on **Figure 3.3**.

This SWO has been designed to operate to meet the definition of '*Storm Water Overflow'* as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows'*, 1995. The following measures are also in place:

- A 2,400m^3 Stormwater Holding Tank will be provided at the new Pumping Station, flows in excess of the Stormwater Tanks capacity will overflow to the Blackwater River;
- Overflows from the Storm Water Holding Tank will be screened by self-cleaning mechanical screens with a maximum passage of 6mm;
- The project will include the installation of a new SCADA and telemetry system, this system will ensure compliance and compatibility with IW's Design Specifications;
- Provision for a standby power supply will be made at the new Mallow Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply;
- Provision for a standby power supply will be made at the Mallow WwTP to provide for continued operation of the wastewater treatment equipment in the event of an interruption in the power supply; and

- All flows will be monitored continuously and recorded by flowmeters at the WwTP and Mallow Bridge Street Pumping Station.

In the event that the storm water tank is at capacity (>2,400m^3) an overflow from the storm tank will be discharged to the River Blackwater *via* a new SWO (SW010 – NGR 156636E, 097862N). Level probes will control the flow in and out of the storm tank. This high-level overflow will be capable of conveying the full storm flow of 3,500 l/s and will not permit backflow from the storm tank to the storm sump. As listed above, overflows to the storm water storage tank will be screened *via* a self-cleaning mechanical screen with a maximum passage of 6mm.

In terms of the impact of an overflow event during low river flow conditions, as part of a request for further information during the planning stage in 2019, TJ O'Connor & Associates carried out a theoretical exercise considering a '*worst case scenario'* 1 year storm event. Using the network model, a storm event that resulted in the highest flow through the overflow storm tank was selected. On the basis of future loads, a series of mass balance calculations was carried out. The predicted resultant concentrations in the river meet the Urban Pollution Manual 99 percentile standards as applicable to WFD High status waters. In reality, the scenario modelled was highly conservative and unlikely to arise as it did not consider any additional flows to the river from the catchment which would occur in a storm event (thus providing greater dilution).

Provision for a standby power supply will be made at the new Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater (Munster)_140 *via* the EO at NGR 156636E, 097862N.

Table 3.1 Operational Discharges Relating to The Mallow WWDA Review

New Discharge Name	Type	Asset	Discharge Location (NGR)
SW001	Primary Discharge	WwTP	157530E 098140N
SW010	Dual Function Overflow (Storm Water Overflow & Emergency Overflow)	New Bridge Street Pumping Station	156636E 097862N

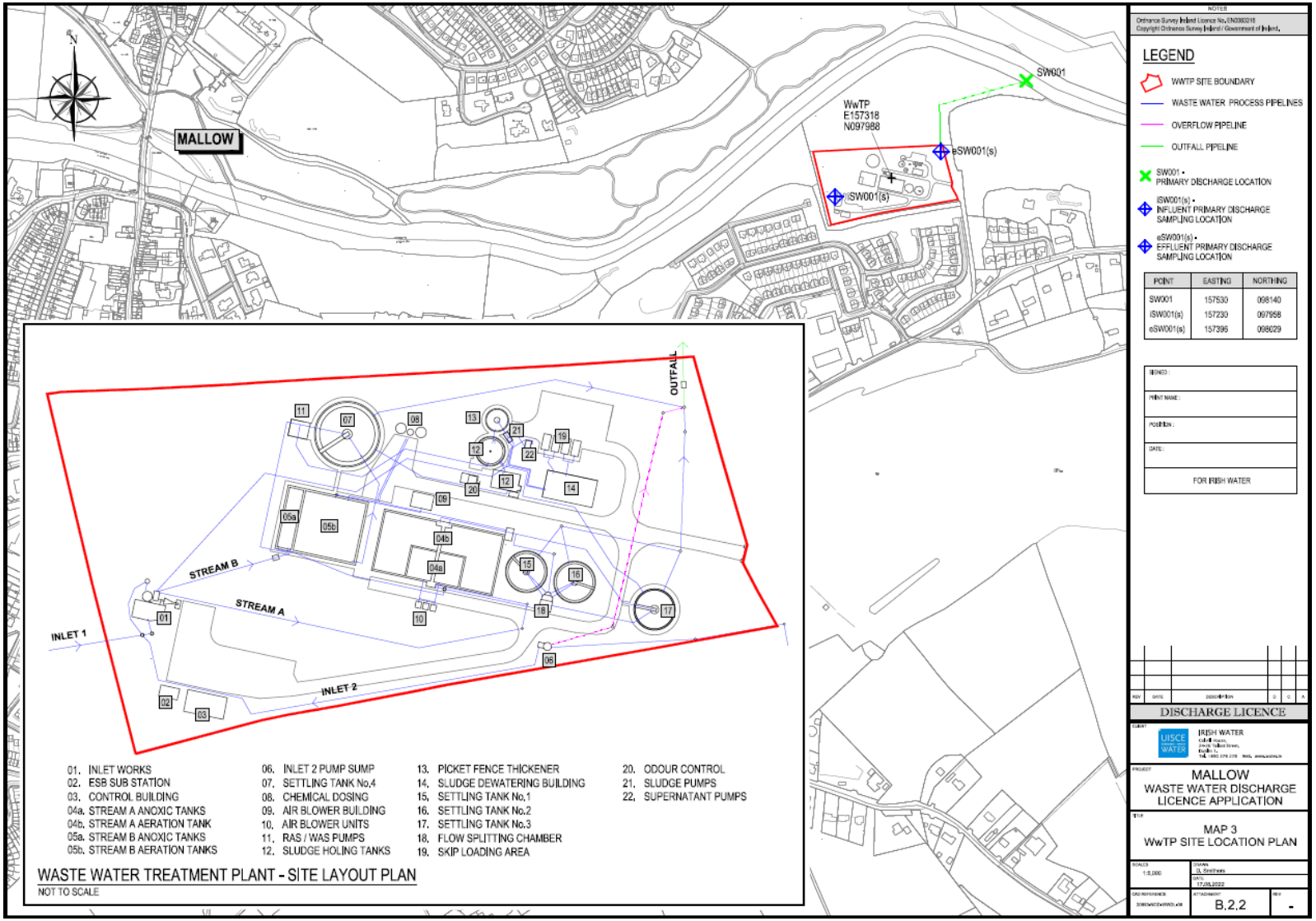

Figure 3.2 Mallow Wastewater Treatment Plant Layout

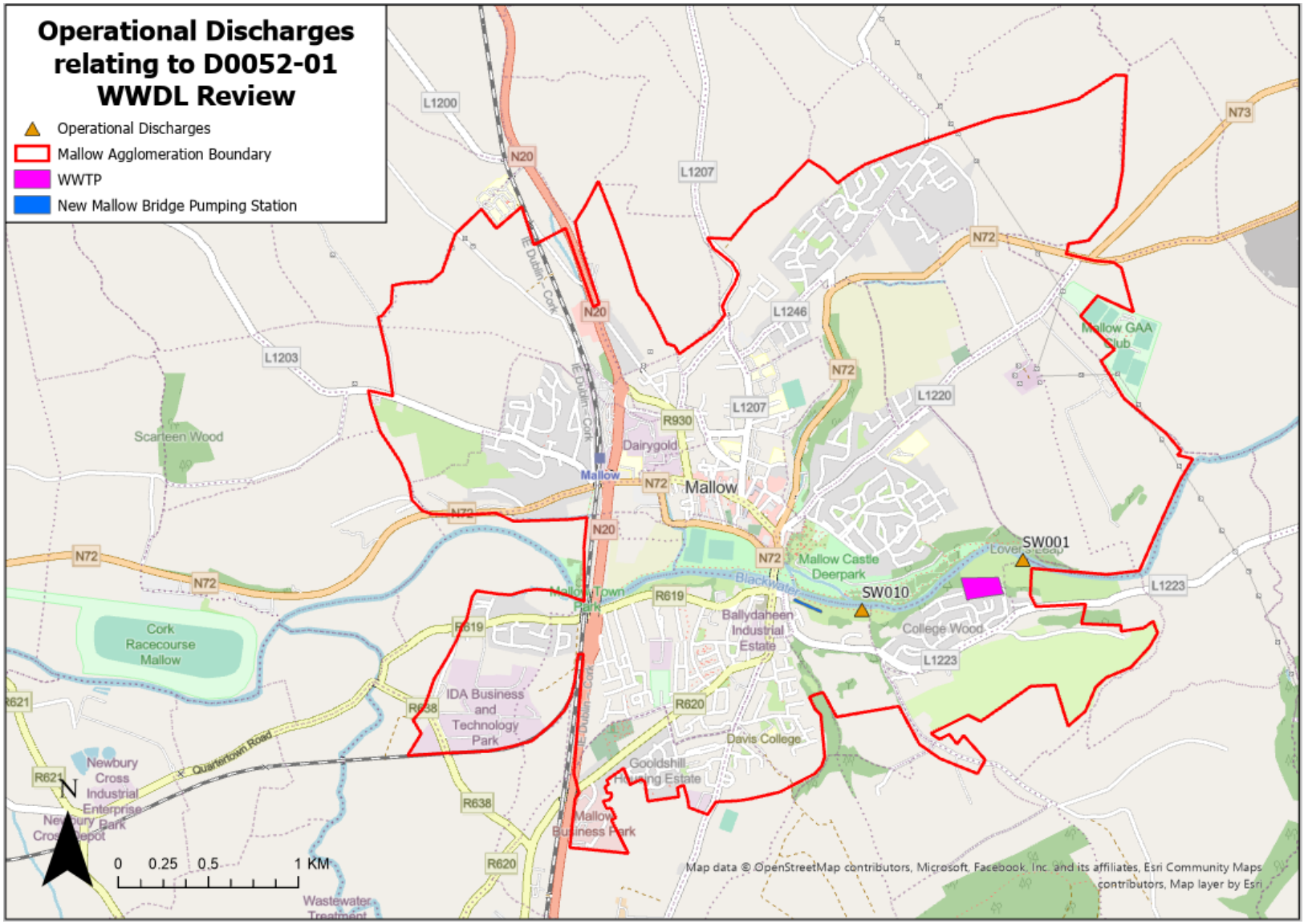

Figure 3.3 Operational Discharges Relating to D0052-01 WWDL Review and Amended Agglomeration Boundary

3.4. Waste Water Treatment Plant Design

Planning Permission was obtained based on the upgraded WwTP (22,000 p.e.) meeting the ELVs as per Schedule A.1. of the WWDL D0052-01 (Tech Amendment A): BOD 25mg/l, COD 125mg/l, SS 25mg/l, pH 6-9 pH units, Total Phosphorous 2mg/l, Ammonia 3mg/l and Ortho-phosphate 1.5mg/l.

Since planning was obtained, a Waste Assimilative Capacity (WAC) calculation was completed in 2022 to inform this WWDA review application to ensure that the above ELVs were fit for purpose based on the latest data available (see **Appendix 2 – Waste Assimilative Capacity Calculations**). It was concluded that a more onerous Ortho-phosphate ELV of 1mg/l was required in order to meet the High-status 95%ile Environmental Quality Standard (EQS) downstream of the primary discharge.

Based on the ELVs in **Table 3.2** the receiving waterbody has the capacity to accommodate the proposed discharge from the upgraded WwTP without causing a breach in the relevant standards as outlined in National and European legislation. This includes ensuring compliance with the High standards set in the European Communities Environmental Objectives (Surface Water) Regulations, 2009, as amended (now S.I. No. 288 of 2022) and that the 2013-2018 High status of both Ammonia and Ortho-phosphate of the Blackwater (Munster)_140 is maintained. Ecological Quality Objectives as set out in the fourth schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) can also be maintained.

Table 3.2 presents the proposed ELVs for the upgraded Mallow WwTP.

Table 3.2 Proposed Emission Limit Values (ELVs)

Parameter	Proposed Emission Limit Value (ELV)
Biological Oxygen Demand	25 mg/l
Chemical Oxygen Demand	125 mg/l
Suspended Solids	25 mg/l
Ortho-phosphate (as P)	1 mg/l
Total Phosphorous (as P)	2 mg/l
Ammonia (as N)	3 mg/l
pH	6 - 9

All flows arriving at the upgraded WwTP will receive secondary treatment with Phosphorus and Nitrogen removal in order to comply with the proposed ELVs tabled above.

These standards give effect to the principle of the Combined Approach as defined in Waste Water Discharge (Authorisation) Regulations, 2007 to 2020 in that they accommodate the Urban Waste Water Regulations, and the status of the receiving waterbody, the Blackwater River.

The Mallow Sewerage Scheme Upgrade Project has been designed to ensure that emissions from the works will not result in the contravention of any relevant EU Directives and National Regulations in accordance with IW's Design Specifications.

3.5. General Operations and Management

3.5.1. Operations and Maintenance Staff

The Mallow WwTP runs automatically and is capable of being monitored on a daily basis *via* the SCADA system. The WwTP is a manned site during normal working hours on Monday – Friday with 24 hour call out response where the amount of time spent on site will vary depending on various factors *e.g.,* weather or breakdowns in plant or maintenance works required such as cleaning of the intake screens *etc*. In general, there are 1-2 people on site during normal operation of the plant. There is also a maintenance team on site for roughly one week a month to carry out any repairs or any other scheduled larger maintenance that may be required.

3.5.2. Environmental and Incident Management

The Operator has, and will continue to have in place, certified Health and Safety (OHSAS 18001) and Environmental (ISO 14001) management systems. The management systems provide for the monitoring of environmental and safety performance and implementation of continuous improvement through associated action programmes. These programmes are frequently and routinely monitored by IW and will continue to be developed over the operating life of the upgraded WwTP.

3.5.3. Measures to Prevent Unintended Discharges

There are accident prevention procedures and emergency response plans and procedures in place to prevent unintended discharges to the receiving waterbody. See **Attachment C.2** of the WWDA Review Application for a full summary of these measures to prevent unintended discharges.

The Mallow Wastewater Treatment Works (WwTW) has been designed to prevent unintended discharges from the works and to ensure that all emissions from the agglomeration comply with, and will not result in the contravention, of any national or European legislation.

In accordance with its EPA WWDL, procedures are in place to notify the EPA of emergencies, exceedance of licence conditions, and where environmental pollution has, or may have, taken place.

3.5.4. Environmental Monitoring

A monitoring programme of the effluent discharge and ambient water quality is currently in place and will continue to be in place as per the WWDL requirements. Refer to Schedule A: *Discharges & Discharge Monitoring*, and Schedule B: *Ambient Monitoring* of WWDL D0052-01 for details on the current monitoring regime.

The results from this monitoring programme are provided in the conditioned Annual Environmental Report (AER) which is submitted to the EPA on an annual basis.

4. POLICY AND LEGISLATIVE CONTEXT

4.1. Introduction

This Chapter of the EIAR summarises the key relevant legislation, policy and guidance at EU, national, regional, and local levels in the context of the Project *i.e.*, in relation to the Mallow agglomeration operational discharges (SW001 & SW010). Reference to planning and policy related to the WwTP upgrade itself is only included where relevant to the Project.

4.2. European legislation

4.2.1. EU Urban Waste Water Treatment Directive

Council Directive 91/271/EEC concerning Urban Waste Water Treatment (known as the Urban Waste Water Treatment (UWWT) Directive) aims to protect human health and the environment from adverse effects of discharges from urban wastewater and certain industrial discharges, setting standards to ensure that Member States' urban cities, towns and settlements, properly collect and treat wastewater prior to discharge. Directive 98/15/EC amends Directive 91/271/EEC and clarifies the requirements of the Directive in relation to discharges from urban wastewater treatment plants to sensitive areas that are vulnerable to eutrophication.

The Urban Waste Water Treatment Regulations, 2001, S.I. No. 254/2001 (as amended) transpose the UWWT Directive into Irish legislation.

The Blackwater (Munster)_140 is designated as a nutrient sensitive area in accordance with the Urban Waste Water Treatment (UWWT) Directive 91/271/EEC on Urban Waste Water Treatment, with Phosphorus being the limiting nutrient in this waterbody.

As described in **Chapter 3**, the upgraded Mallow WwTP is designed to include secondary treatment with Phosphorus and also Nitrogen removal.

The overflow at the new Bridge Street Pumping Station has been designed to meet the definition of '*Storm Water Overflow'* as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended, and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows'*, 1995. Provision has been made for a standby power supply to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. The above, along with the removal of 8 licenced SWOs and 1 unlicensed SWO in the current Mallow agglomeration, will ensure for the protection of the sensitive receiving aquatic environment.

Thus, once completed, the upgraded Mallow WwTW will be compliant with the UWWT Directive.

4.2.2. EU Water Framework Directive

The EU Water Framework Directive (WFD) (2000/60/EC) establishes a framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater and their dependent wildlife/habitats under one piece of environmental legislation. It requires the achievement of 'Good Status' for all these waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both 'Good Ecological Status' and 'Good Chemical

Status'. The classification for water quality is described based on biological, physico-chemical and hydromorphological quality elements.

The main tool for Member States' implementation of the WFD, is River Basin Management Plan (RBMP)s. The next River Basin Management Plan to be implemented is the draft 3rd River Basin Management Plan (2022-2027). Water bodies identified as being *'At Risk'* of not achieving their environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. The manner and the timeframe in which these targeted measures are implemented need to be prioritised to take account of the finite resources available and of the time and resources needed to develop appropriate measures.

The European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009, as amended by the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations, 2019 (S.I. No. 77 of 2019) and then most recently the European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2022 (S.I. No. 288 of 2022), are one of the pieces of legislation that transposes the WFD. The Regulations prescribe quality elements and quantify parameters used to classify surface water bodies as defined in the WFD.

Irish Water are committed to ensuring that water services infrastructure operates in a manner that supports the achievement of the water body objectives under the Water Framework Directive.

As identified in **Chapter 3**, the proposed operational discharges will discharge in the Blackwater (Munster)_140, which has a WFD designation of Good status (2013-2018 & 2016-2021). Approximately 0.7km downstream of the discharge point the Blackwater (Munster)_140 flows into the Blackwater (Munster)_150 which is classed as Good status, before flowing into the Blackwater (Munster)_160 *ca.* 2.5km downstream, where it is classed as Moderate status.

A separate WFD Screening Assessment was carried out on the Project (refer to **Appendix 3**). The WFD Screening Assessment informed **Chapter 6** that assesses likely significant effects on surface water.

4.2.3. EU Nature Directives

The EU Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) are the core pieces of legislation implementing the EU's Biodiversity Strategy. The Habitats Directive provides the framework for legal protection for habitats and species of European conservation significance while the Birds Directive focuses on the protection of all wild bird species occurring in the EU. The nature directives provide the legislative means to establish a network of sites (known as the Natura 2000 network) throughout the EU with the objective of conserving habitats and species deemed of conservation significance both at community level, and on an international scale. The Natura 2000 network includes Special Area of Conservation (SACs) designated under the Habitats Directive, and Special Protection Areas (SPAs) designated under the Birds Directive.

The EU Habitats Directive was transposed into Irish legislation through the European Union (Natural Habitats) Regulations, S.I. No. 94 of 1997. These Regulations were amended by S.I. No. 233 of 1998 and S.I. No. 378 of 2005. The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural

Habitats) (Control of Recreational Activities) Regulations 2010, as well as addressing transposition failures identified in the Court of Justice of the European Union (CJEU) judgments.

Article 6, paragraphs 3 and 4 of the EU Habitats Directive require that an Appropriate Assessment (AA) is carried out for plans and projects that are not directly connected with or necessary to the management of the designated European site that could, however, result in a potential significant effect on the designated site. Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations 2011, sets out the requirements for screening and conducting AA in Ireland.

As identified in **Chapter 3**, there is a European Site within the immediate zone of influence of the project *i.e.,* Blackwater River (Cork/Waterford) SAC (Site code: 002170). Further downstream of the operational discharges (*ca.* 27km), the next closest European site is the Blackwater Callows SPA (Site code: 004094).

A combined Appropriate Assessment (AA) Screening Report and Natura Impact Statement was prepared in November 2022 to accompany the Mallow WWDL review application. This Report will enable the EPA as the CA to conduct an AA Screening Determination and Stage 2 AA in respect of the Mallow agglomeration operational discharges, for the purposes of the European Union (Waste Water Discharge) Regulations 2007 to 2020.

Please refer to **Attachment D.2.2** of the WWDL Review Application for a copy the Appropriate Assessment Screening Report and NIS (November 2022).

4.3. National Policy and Plans

4.3.1. Water

4.3.1.1. Water Services Strategic Plan: A Plan for the Future of Water Services (2015-2040)

The Water Services Strategic Plan (WSSP) sets out Irish Water's strategic objectives in its provision of water services. The six objectives are to:

- meet customer expectations;
- ensure a safe and reliable water supply;
- provide effective management of wastewater;
- protect and enhance the environment;
- support social and economic growth; and
- invest in the future of IW.

The plan identifies wastewater collection and treatment as one of the challenges to address. It specifies a main common problem is that combined sewers in many urban areas receive rainfall runoff in addition to wastewater. This frequently causes overload during heavy rainfall periods giving rise to overflows that can result in untreated water reaching, and polluting, watercourses. Mallow is one of the sites specified in the WSSP that needs to be upgraded to address compliance issues with the UWWT Directive.

As described in **Chapter 3**, the Mallow Sewerage Scheme Upgrade Project allows for the removal of 9 no. SWOs currently on the network, and increased pumping capacity and treatment capacity at the WwTP.

4.3.1.2. Irish Water's Capital Investment Plan 2020-2024

As the national public water services utility, IW is responsible for providing and developing water services throughout Ireland. Part of its statutory requirements include the preparation of business plans to the Commission for Regulation of Utilities (CRU) and the EPA. The Mallow WwTP is included in the list of projects for the 2020-2024 investment period.

4.3.1.3. River Basin Management Plan for Ireland

The second cycle RBMP covers the period 2018-2021. The third cycle RBMP is currently in draft and covers 2022-2027. Under the requirements of the WFD, the RBMP must include a programme of measures to protect and restore most water bodies to at least 'good' status by 2027. The new operational discharges will contribute to the RBMP objectives in contributing to safeguarding the Good status of the Blackwater River at the discharge points and could potentially contribute to the improvement of the Blackwater River further downstream.

The WFD Screening Assessment (**Appendix 3**) and **Chapter 6** Water assess the potential impacts as a result of the Project.

4.3.2. Biodiversity

4.3.2.1. National Biodiversity Action Plan

The consultation stage for the draft fourth National Biodiversity Action Plan has recently been concluded, and review of feedback is currently underway. The National Biodiversity Action Plan (2017-2021) lists seven objectives:

- Objective 1: Mainstream biodiversity into decision-making across all sectors
- Objective 2: Strengthen the knowledge base for conservation, management, and sustainable use of biodiversity
- Objective 3: Increase awareness and appreciation of biodiversity and ecosystem services
- Objective 4: Conserve and restore biodiversity and ecosystem services in the wider countryside
- Objective 5: Conserve and restore biodiversity and ecosystem services in the marine environment
- Objective 6: Expand and improve management of protected areas and species
- Objective 7: Strengthen international governance for biodiversity and ecosystem services.

Target 4.2 under Objective 4 aims to ensure that principal pollutant pressures on terrestrial and freshwater biodiversity are substantially reduced by 2020. Three actions are identified

to reach the target. Action 4.2.1 calls for the continued protection, enhancement and monitoring of the ecological status under the WFD, including reducing risks to water quality. Action 4.2.2 calls for IW to implement its WSSP.

Target 6.3 is to ensure that *no protected species are in a worsening status by 2020; majority species, in or moving towards, favourable status by 2020.* Action 6.3.3 focuses on the development, adoption and implementation of restoration programmes for a number of fish species including salmon and eels, both of importance and recorded in the Blackwater River as described in **Chapter 5**. The action includes focusing on the improvement of passage of migratory fish species. Potential impacts to fish ecology are assessed in **Chapter 5**.

4.3.2.2. Irish Water's Biodiversity Action Plan

Irish Water's Biodiversity Action Plan (BAP) sets out a national programme of measures to protect and enhance biodiversity across Irish Water sites. Irish Water recognises the need to urgently increase and accelerate efforts to halt the decline of biodiversity and are fully committed to ensuring that they build and manage their infrastructure responsibly so that our ecosystems are protected, and where possible enhanced.

Refer to **Chapter 5** Biodiversity of this EIAR for further details.

4.3.3. Climate

4.3.3.1. Climate Action Plan

Ireland's Climate Action Plan 2021 sets out a plan of action with a target to achieve a 51% reduction in overall greenhouse gas (GHG) emissions by 2030 and net-zero emissions by 2050 as committed in the Programme for Government and set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

The Plan aims to address various sectors and challenges both on land and in the marine environment. The Project falls within the Water Resource and Flood Risk Management scheme as Water Services Infrastructure. Potential climate change impacts that could affect the sector are identified including the potential for increased waterborne disease from contamination of drinking water resulting from overland flows of pollutants. The Plan will be updated annually to ensure alignment with carbon budgets and sectoral ceilings.

Refer to **Chapter 10** Air Quality and Climate of this EIAR.

4.3.3.2. Cork County Council Climate Adaptation Strategy

The Cork County Council's Climate Adaptation Strategy 2019-2024 seeks to enhance resilience to climate hazards. The Strategy presents actions to address challenges and develop innovative and sustainable solutions that address adaptation and enhance resilience to climate change. The Strategy lists seven high level goals:

- Local adaptation governance and business operations;
- Infrastructure and built environment;
- Land use and development;
- Drainage and flood management;

- Natural environment, built and cultural heritage;
- Community, health and wellbeing; and
- Other sectors and agencies.

The strategy includes a risk register that identifies hazards and consequences of extreme climate events and the services and business functions that could be impacted. In the context of drainage and flood management, wastewater is included on the risk register. The register identifies that rainfall or heatwave events could affect inflow and infiltration to the wastewater network and could cause interruptions to the anaerobic process. **Chapter 16** assesses potential risks, including from extreme events, and specifically from heavy rainfall.

4.3.4. Planning Framework

4.3.4.1. National Planning Framework

The National Planning Framework (NPF), published in February 2018, is the Government's high-level strategic plan for shaping the future growth and development of Ireland to the year 2040. The NPF is a region-focused strategy for managing growth, using state lands for certain strategic purposes, and supporting this with strengthened, more environmentally focused planning at local level. The NPF is given effect with a 10-year capital investment programme in the National Development Plan 2018 – 2027 (NDP).

4.3.4.2. Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial and Economic Strategy (RSES) for the Southern Region provides the tool for implementation of the vision and objectives of the National Planning Framework for the Region. Mallow is the largest town in North County Cork and is recognised as a strategic population and employment growth centre. The town is located in the special conservation area of the River Blackwater Valley. The RSES identifies that it is undergoing an infrastructure-led phased expansion and offers high quality of life with current amenities and future opportunities.

Policy RPO19d addresses future growth of Mallow town and specifies the need to consult with IW to ensure sufficient wastewater capacity is accounted for as the town grows whilst avoiding negative impacts on the nutrient sensitive River Blackwater. The new operational discharges are aligned with the wider scope of increased and improved operational capacity of the permitted Mallow WwTP.

4.3.4.3. County Cork Development Plan

Chapter 11 of the County Cork Development Plan 2022-2028 addresses water management and considers *the provision and improvement of water, wastewater, surface water and flood alleviation services so as to facilitate development, support the delivery of population, housing and growth targets and prioritised so as to protect public health and protect, restore and improve the receiving environment and water quality.*

Policy WM11-1 addresses the WFD and the River Basin Management Plan. It calls for the prioritisation of the provision of water services infrastructure in all settlements where services are not meeting current needs and are failing to meet the requirements of the

UWWT Directive, and where there is a threat to breaches in the WFD and European sites requirements as a result. This policy also restricts development if appropriate wastewater treatment, which meets the requirements of the WFD and Habitats Directives, is not available. Restricting further development in the absence of adequate wastewater is reiterated through policy WM11-9.

Policy WM11-7 requires that the design and planning of water services infrastructure will consider the potential impacts of climate change and the need to increase the resilience of this infrastructure to any such impacts.

With respect to ELVs, Chapter 11 (para. 11.5.16) identifies that *in assessing the capacity of a WWTP to cater for future development where an ELV issue pertains, the assessment has been based on the hydraulic and organic loadings of the treatment plant relative to its design capacity on the assumption that the ELV issue will be resolved in an approach that will be determined/ agreed at a national level between Irish Water and the EPA.*

Section 11.9 highlights the importance of retaining sufficient assimilative capacity in the County's waterbodies to allow for sustainable growth of settlements. This is further supported through Core Strategy Objective CS2-7 requiring that the future growth of Mallow *should be planned for on a phased basis in consultation with the Local Authority and Irish Water to ensure that sufficient wastewater capacity is accounted for and that further growth avoids negative impacts on the nutrient sensitive River Blackwater.*

The upgrades to the Mallow WwTW, including the operational discharges, as described in **Chapter 3,** are in line with the above.

Refer also to **Chapter 5** Biodiversity and **Chapter 6** Water of this EIAR for further details.

4.3.4.4. Kanturk Mallow Municipal District: Local Area Plan

The Local Area Plan (2017) for Mallow recognises the need to upgrade the Mallow WwTP to cater for the target population of Mallow and General Objective for Mallow MW-GO-02 specifies the need for appropriate and sustainable wastewater infrastructure that secures the objectives of the RBMP and the River Blackwater SAC to ensure sustainable population growth. General Objective MW-GO-03 specifies that development in the town will only be permitted where it is shown that it is compatible with the requirements of the Habitat Directive and the protection of the River Blackwater.

The upgrades to the Mallow WwTW, including the operational discharges, as described in **Chapter 3,** are in line with the above local planning policy objectives.

4.4. National Legislation

National legislation relevant to each environmental factor is referenced in the specialist chapters as relevant in the context of the proposed new operational discharges.

5. BIODIVERSITY

5.1. Introduction

This Chapter prepared by Thorne Ecology provides an Ecological Impact Assessment (EcIA) of the Mallow agglomeration operational discharges (*i.e.*, the operational discharge activities from the Mallow agglomeration after the completion of the Mallow Sewerage Scheme Upgrade Project).

The purpose of this Chapter of the EIAR is to assess the potential ecological impacts of "*The Project" i.e.,* operational discharges arising from the Mallow agglomeration in accordance with the relevant legislation and guidance.

Mallow town lies within an agricultural landscape on the N20 *ca*. 30km north of Cork City. The WwTP is located on the east side of the town on the banks of the Blackwater River. The new Bridge Street Pumping Station is located at Bearforest Lower, west of the WwTP, and also on the banks of the River Blackwater. The 2 no. operational discharges ("*The Project*"), namely SW001, the primary discharge from the upgraded WwTP and SW010, a Dual Function Overflow from the new Mallow Bridge Street Pumping Station, under consideration herein discharge directly into the Blackwater River (Blackwater (Munster)_140) (**Figure 5.1**).

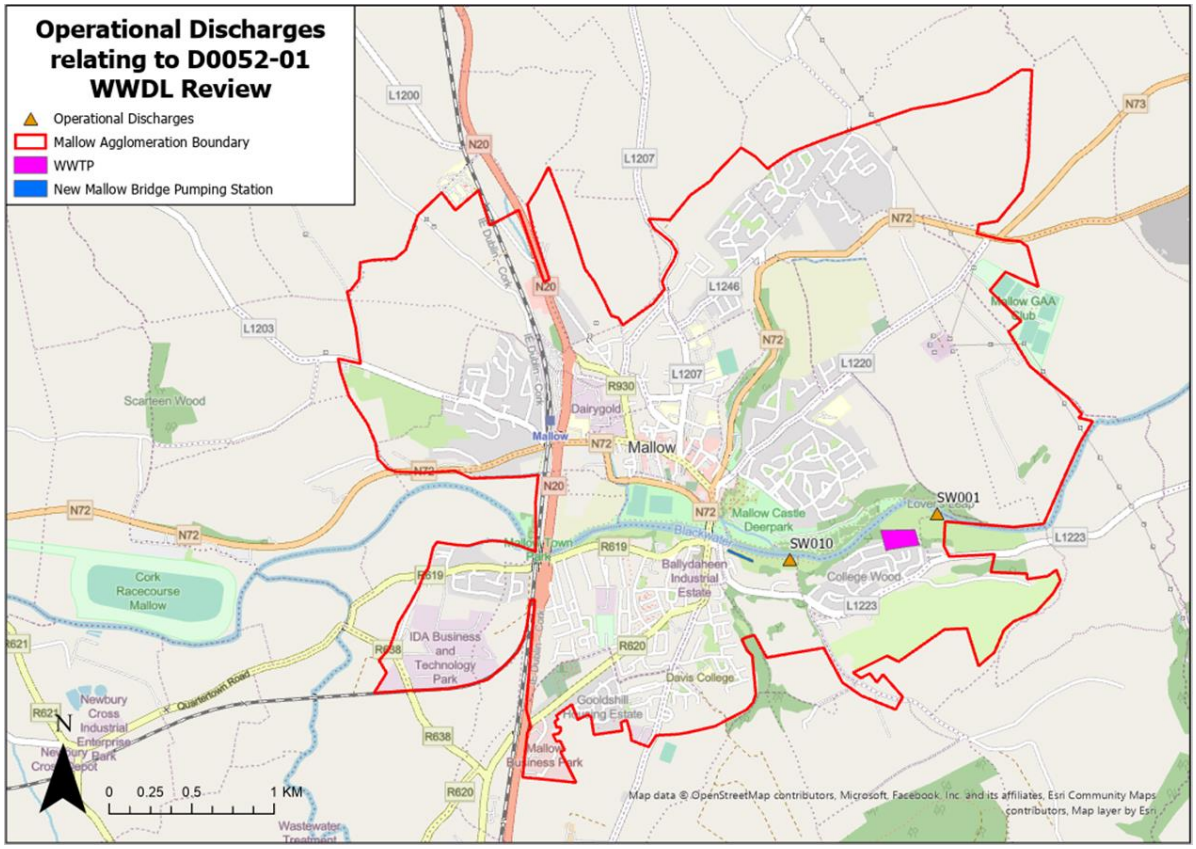

Figure 5.1. Operational Discharges Relating To D0052-01 WWDL Review

The purpose of this Chapter is to:

- Describe and evaluate the baseline ecological environment relevant to the 2 no. operational discharges;
- Identify and assess all potentially significant ecological effects associated with the operational discharges;
- Set out the mitigation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- Provide an assessment of the significance of any residual effects; and
- Where relevant, identify any monitoring requirements.

5.1.1. Statement of Authority

This Chapter was completed by Kate Harrington MSc MCIEEM, an Ecologist who has 18 years' experience in undertaking ecological surveys and assessments in Ireland and abroad. Ms Harrington's experience includes the preparation of AA Screening, NIS, Ecological Impact Assessments, biodiversity studies and water quality studies for a range of infrastructure projects. She has extensive experience of reviewing and undertaking ecological assessments for IW projects and activities as well as developing guidance documents and advising consultant engineers and ecologists regarding best practice. She currently works as a freelance ecologist and is pursuing a PhD in woodland ecology.

5.2. Methodology

5.2.1. Legislative & Policy Context

The assessment was conducted with regard to current legislation including:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive (79/409/EEC as amended (Birds Directive)) – transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011 as amended;
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009;
- Flora Protection Order, 2015;
- Water Framework Directive (2000/60/EC) & the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 272 of 2009), as amended;
- Wildlife Act 1976, as amended.

Policies and Objectives in the following Plans were also considered:

- The National Biodiversity Action Plan 2017-2021 (NBAP) & Irelands 4th National Biodiversity Action Plan - Draft for Public Consultation September 2022;
- Irish Waters Biodiversity Action Plan;
- River Basin Management Plan (2nd Cycle & Draft 3rd Cycle Plans); and
- Cork County Development Plan 2022-2028.

5.2.2. Desk Study

The sources of available desktop information used to inform the assessment included:

- The National Parks and Wildlife Service (NPWS) natural heritage database (www.npws.ie) was consulted for designated sites of nature conservation interest in the study area;
- The National Biodiversity Data Centre (NBDC) species database (http://www.biodiversityireland.ie/) and BSBI database https://database.bsbi.org/ were consulted to obtain species records in the study area.
- The Environmental Protection Agency mapping system (https://gis.epa.ie/EPAMaps/), and www.catchments.ie website for data related to water quality;
- The Inland Fisheries Ireland (IFI) website and www.wfdfish.ie website for fisheries data;
- Ordnance Survey Ireland mapping and aerial photography from http://map.geohive.ie/;
- Geological Survey Ireland (GSI) data and maps https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx ;
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/;
- DixonBrosnan (2019a) Natura Impact Statement – Mallow Sewerage Scheme. Report for TJ O'Connor & Associates. Dated April 2019. Available on Cork Co. Co. Planning System Reference 195078;
- DixonBrosnan (2019b) Ecological Impact Assessment – Mallow Sewerage Scheme. Report for TJ O'Connor & Associates. Dated April 2019. Available on Cork Co. Co. Planning System Reference 195078;
- DixonBrosnan (2019c) Appendix G (Ecological FI Queries) Appendix 3 - Lamprey breeding survey and assessment of potential salmon spawning habitat for the pipeline crossing area for the Mallow Sewerage Scheme, Co. Cork. Available on Cork Co. Co. Planning System Reference 195078; and
- TJ O'Connor & Associates (2019) Mallow Sewerage Scheme – Planning Further Information Response. October 2019. Available on Cork Co. Co. Planning System Reference 195078.

5.2.3. Field Study

A walkover survey was carried out by the author on September 12th 2022. The relevant discharge locations (SW001 and SW010) were visited with the aim of identifying the aquatic habitats in the receiving waters, and determining what ecological receptors occur, or have the potential to occur, within the zone of influence of the discharges. Habitats were classified with reference to The Heritage Council's *'A Guide to Habitats in Ireland'* (Fossitt, 2000)[2] and the Annex I interpretation manual. [3] Searches for protected species followed NRA (2009)[4] guidance. Salmonid habitat was assessed for adult, juvenile and nursery habitat potential following DANI guidelines[5], while lamprey habitat potential was assessed following Harvey & Cowx (2003)[6].

5.2.4. Assessment Methodology

The assessment was completed with regard to the following guidance:

- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Version 1.2- Updated April 2022.
- Environmental Protection Agency (EPA) (2022), Guidelines on the information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, May 2022.
- NRA (2009) Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2, National Roads Authority7; and
- DHPLG (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. Department of Housing, Planning and Local Government.

An Ecological Impact Assessment focuses on Key Ecological Receptors (KERs) which are identified by determining the potential Zone of Influence (ZoI) of the project for each potential receptor, in the context of the scale and nature of the project. The ZoI will vary for each ecological feature and their relative sensitivity to the development, but the central consideration is whether source-pathway-receptor connectivity could be established, where:

- A '*source*' is defined as the individual element of the proposed works that has the potential to impact on an ecological receptor.

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[2] *https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf*

[3] *Interpretation Manual of European Union Habitats – EUR28 https://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/Int_Manual_EU28.pdf*

[4] *NRA (2009) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes https://www.tii.ie/technical-services/environment/planning/Ecological-Surveying-Techniques-for-Protected-Flora-and-Fauna-during-the-Planning-of-National-Road-Schemes.pdf*

[5] *https://www.daera-ni.gov.uk/sites/default/files/publications/dcal/provision-of-salmon-and-trout-habitat-leaflet.pdf*

[6] *Harvey J & Cowx I (2003). Monitoring the River, Brook and Sea Lamprey, Lampetra fluviatilis, L. planeri and Petromyzon marinus. Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough*

[7] *National Roads Authority (NRA) is now Transport Infrastructure Ireland (TII)*

- A *'pathway'* is defined as the means or route (*i.e.,* land, air, hydrological, hydrogeological pathways, *etc*.) by which a source can affect the ecological receptor; and
- A '*receptor*' is defined ecological sites, habitats, features, assemblages, species or individuals that occur in the vicinity of a project and upon which impacts are likely.

KERs will include those habitats and species permanently or temporarily within the development site and surrounding area, as well as those potentially connected *via* air, noise, or water pathways outside the site.

Ecological receptors are evaluated on the basis of the ecological assessment scheme set out in NRA (2009) and CIEEM (2018) guidance. This scheme considers the rarity, status and distribution of the habitat, species, or groups of species within a geographic spatial framework. Ecological receptors are then assigned international, national, county, high local or low local value.

Following CIEEM guidance, impacts to KER's are then characterised considering whether they are positive/negative and the extent, magnitude, duration, frequency, timing, and irreversibility.

Mitigation is prescribed for potentially significant effects in order to avoid, reduce or offset the effects. This is followed by an assessment of residual effects and a conclusion regarding the significance of the effects. A significant effect is one which supports or undermines the conservation objectives[8] for KER's or for biodiversity in general (CIEEM, 2018). Significant effects should be qualified with reference to the appropriate geographic scale (CIEEM, 2018) noting impacts may be significant at a lower geographic level than that at which the receptor has been valued.

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018). Different types of actions can cause cumulative impacts and effects:

- Additive/incremental – in which multiple activities/projects (each with potentially insignificant effects) added together to give rise to a significant effect due to their proximity in time and space (CIEEM, 2018).
- Associated/connected – a development activity enables another development activity *e.g.,* phased development as part of separate planning applications. Associated developments may include different aspects of the project which may be authorised under different consent processes. It is important to assess impacts of the project as a whole and not ignore impacts that fall under a separate consent process (CIEEM, 2018).

Cumulative effects are considered with the following types of future development within the ZoI; proposals for which consent has been applied which are awaiting decision including those subject to appeal; projects which have been granted consent (not limited to planning permissions) but which have not yet been started or which have been started

[8] *While government-defined conservation objectives are central to assessing sites designated under the Habitats and Birds Directives, the concept also applies to EcIA in that any ecological receptor will have associated structural, composition and functional requirements, including interactions with other receptors, that must be met in order to sustain its ecological value.*

but are not yet completed (*i.e*. under construction) and proposals by public authorities that can be reasonably foreseen (*e.g*. specified in development plans).

5.2.5. EIAR Scoping

Irish Water issued a request to the EPA on the 30th August 2022 for a Scoping Opinion on the scope and level of detail to be included in an EIAR for the Mallow Waste Water Discharge Licence (D0052-01) review. In accordance with the requirements of Regulation 17C & 17D of the European Union (Waste Water Discharge) Regulations 2007 to 2020 (WWD Regulations), the EPA consulted with the relevant prescribed bodies under Regulation 21(1) of the above referenced WWD Regulations. One scoping response was received from Cork County Council. The other prescribed bodies did not provide a response within the timeframe set out.

In relation to Biodiversity, Cork County Council's submission stated the following:

The proposed operational discharges will discharge in the Blackwater (Munster)_130 and Blackwater (Munster)_140, both of which have a WFD 2013-2018 designation of "GOOD" status. The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (Margaritifera Margaritifera) catchment under the First Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) and is also a Special Area of Conservation designated for the protection of a range of freshwater species and habitats. The EPA as competent authority to confirm through the EIA and AA processes that licence emission limit values are established at limits which can ensure that Ecological Quality Objectives as set out in the fourth schedule of the FWPM Regulations can be maintained, and that the Conservation Objectives for all qualifying interests of the Special Area of Conservation are also met.

The scope of this Chapter and assessment contained therein has taken full regard of the above submission.

5.3. Receiving Environment

The Project has been described in full in **Chapter 3** of this EIAR.

5.3.1. Water Quality

The agglomeration operational discharges to the River Blackwater are presented below (**Table 5.1**). These include the primary discharge from the upgraded WwTP (SW001) and 1 no. Dual Function Overflow which can function as a SWO or EO, depending on the event. They both enter the Blackwater (Munster)_140 waterbody which is assigned Good WFD status (2013-2018). For 2013-2018 and 2016-2021, both Ammonium and Ortho-phosphate are noted as High under WFD status. There are no significant pressures identified for this waterbody.

Table 5.1 Operational Discharges Relating to The Mallow WWDA Review

New Discharge Name	Type	Asset	Discharge Location (NGR)
SW001	Primary Discharge	WwTP	157530E 098140N
SW010*	Dual Function Overflow (Storm Water Overflow & Emergency Overflow)	New Bridge Street Pumping Station	156636E 097862N

The EPA monitor biological water quality at Station RS18B021500 (Rly Br Mallow LHS) which is *ca*. 1.5km upstream of SW010. This station was assigned a Q4 score in 2021 indicating Good water quality conditions. The station RS18B021510 (Rly Bridge, Mallow RHS) just downstream of RS18B021500 was assigned Q3-4 – Moderate Status at the last measurement (2021). The next Q value monitoring point downstream is RS18B021800 (NE of Ballymagooly) *ca.* 2.5km downstream of SW001, which was monitored in 2020 and also assigned a Q4 score.

Water chemistry is monitored by Cork Co. Co./EPA at:

- RS18B021600 (Mallow Br) - *ca.* 500m upstream of SW010
- RS18B021690 (1.2km d/s Mallow Br (u/s STW)) - *ca*. 50m upstream of SW001
- RS18B021720 (Downstream of TPEFF0500D0052SW001) - *ca.* 560m downstream of SW001

The most recent 18 months of data for key parameters are shown below in **Table 5.2** Monitoring locations are shown on **Figure 5.2.**

Results were compared with the Environmental Quality Standards specified in the Surface Waters Regulations 2009 (as amended) with exceedances of the Good and High 95%le EQSs highlighted in red and blue bold respectively. Generally, at least Good status conditions are met upstream and downstream of the operational discharge with occasional exceedances. On most sampling occasions the results meet the High status limit. The current WFD target objective for the waterbody is to maintain Good status. The River Blackwater is a salmonid river for which the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293 of 1988) apply, and based on the parameters presented below the requirements of these regulations are also met (suspended solids were not monitored).

Table 5.2 River Blackwater Water Quality Monitoring

Sample Date	Ammonia mg/l	BOD mg/l	DO % Sat	Ortho-P mg/l	pH
	95%ile EQS: **≤0.14 (good)** **≤0.090 (high)** Mean EQS : ≤0.065 (good) ≤0.040 (high)	95%ile EQS : **≤2.6 (good)** **≤2.2 (high)**	95%ile EQS : 80-120%	95%ile EQS: **≤0.075 (good)** **≤0.045 (high)** Mean: ≤0.035 (good) ≤0.025 (high)	EQS 4.5< pH < 9.0 (Soft water)
RS18B021600					
13/01/2021	0.035	0.8	100	0.024	7.6
25/02/2021	0.038	0.7	96	0.031	7.5
03/03/2021	0.021	0.3	98	0.023	8
06/05/2021	0.01	0.9	86	0.003	8
19/05/2021	0.025	1.8	85	0.01	7.8
03/06/2021	0.022	1.7	97	0.008	7.8
14/07/2021	0.025	1	98.7	0.017	7.9
05/08/2021	0.009	**2.3**	103.2	0.005	8.2
30/09/2021	0.017	1.8	101.7	0.031	7.9
04/11/2021	0.01	0.1	97	0.032	7.7
02/12/2021	0.025	**2.5**	97	0.031	7.6
06/12/2021	**0.163**	NT	99	**0.048**	7.6
09/12/2021	0.047	1.6	100.7	0.022	7.6
09/12/2021	0.051	0.7	99	**0.054**	7.2
15/12/2021	**0.17**	1.3	100	0.044	7.6
10/03/2022	0.063	0.4	95	**0.058**	6.9
13/04/2022	0.01	1.3	95	0.009	7.2
18/05/2022	0.032	1.6	96	0.011	7.8
01/06/2022	0.023	0.7	102	0.021	7.4
14/07/2022	**0.094**	**3.7**	107	**0.106**	7.8
04/08/2022	0.032	2.7	94	**0.115**	7.5
RS18B021690					
13/04/2022	0.01	1.4	96	0.021	7.3
14/07/2022	0.088	**3.6**	107	**0.096**	7.6
RS18B021720					
13/01/2021	0.043	0.7	102	0.035	7.6
03/03/2021	0.027	1	100	0.022	8
06/05/2021	0.01	1.1	99	0.007	8
19/05/2021	0.027	**8.5**	99	0.013	7.7
03/06/2021	0.027	1.7	98	0.008	7.8
08/07/2021	0.043	1.1	95	0.028	7.8
05/08/2021	0.028	1.8	101	0.014	8
13/10/2021	0.032	**2.9**	94	**0.073**	8.1
04/11/2021	0.023	0.2	97	**0.071**	7.6
02/12/2021	0.025	**2.5**	97	0.031	7.6
10/03/2022	0.05	0.8	92	0.038	6.9
18/05/2022	0.055	1.7	96	0.005	7.7
01/06/2022	0.01	1.1	102	**0.045**	7.4
04/08/2022	0.028	0.8	94	0.032	7.5

Figure 5.2 Monitoring Stations and Discharge Points (Source EPA Maps Accessed 19/09/2022)

5.3.2. Ecological Desktop & Field Survey

The ecological receptors of the site and surrounding area of the 2 no. operational discharges are described below, informed by the desk study and site visit. On the basis of the survey results, and as described under '*Assessment Methodology'*, Key Ecological Receptors (KERs) are identified by determining the potential Zone of Influence (ZoI) of the project for each potential receptor, in the context of the scale and nature of the project and the presence of a source-pathway-receptor connection. In the context of this Project, the survey focuses on aquatic species, or those terrestrial species which may interact with the aquatic environment.

5.3.2.1. Designated Sites

European Sites

Full details of the assessment on European Sites are provided in the combined AA Screening and NIS report prepared for the Mallow WWDL review application. "*The Project*" was screened in for AA as likelihood of significant effects to the Blackwater River (Cork/Waterford) SAC could not be excluded:

"While the Mallow discharges comply with the relevant standards, on a precautionary basis the likelihood of significant effects to aquatic-dependant habitats and species within the SAC cannot be excluded at this stage. Potential adverse effects need to be considered for this SAC in the context of the conservation objectives and targets of the following qualifying interests: Vegetation of flowing waters habitat, alluvial woodland habitat, Freshwater Pearl Mussel, Atlantic salmon, lamprey species, otter, twaite shad and white-clawed crayfish" (Source: AA Screening & Natura Impact Statement Report as part of the Mallow Waste Water Discharge License Review D0052-02, November 2022).

The 2 no. operational discharges directly enter the Blackwater River (Cork/Waterford) SAC. The SAC is designated for the following aquatic habitats and species; Vegetation of flowing waters, Alluvial forests, Freshwater Pearl Mussel, White-clawed Crayfish, Sea Lamprey, River, Lamprey, Twaite Shad, Salmon, and Otter.

This site is of international value and is therefore considered a KER. The NIS determined however that the operational discharges from the Mallow agglomeration do not have the potential to adversely affect the qualifying interests of the Blackwater River (Cork/Waterford) SAC or any other European Site. Consequently, there is no requirement for mitigation measures. To ensure continued satisfactory operation of the Mallow agglomeration in line with the discharge licence the authors recommend the following:

- Ensure that the capacity of the WwTP is not exceeded.
- Ensure all discharges continue to operate in compliance with the ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis.

There is some overlap between the ecological receptors considered herein and the qualifying interests considered in the AA process. While qualifying interests of the SAC may be assigned an international-value level, the assessment herein considers potential effects on populations at a local scale. In contrast, the AA process must consider the

adverse effects on the conservation objectives of the SAC as a whole, and overall site integrity.

Nationally Designated Sites

On review of mapping resources, the following proposed Natural Heritage Areas (pNHA's) were considered:

- Blackwater Valley (Killavullen) (001080) pNHA *ca.* 12km downstream of Mallow along the River Blackwater
- Blackwater Valley (Ballinvurrig Wood) (001793) pNHA *ca.* 15km downstream of Mallow along the River Blackwater

Sites designated as pNHA's are considered to have National value. While there is a paucity of information on pNHA's in general, these sites appear to have been designated based on the information summarised in Goodwillie (1986)[9] which points to selection on the basis of river wetlands, dry woodlands and abundant bird and insect life. These sites overlap with the SAC designation, providing some habitats, flora and fauna with a higher level of protection, but not encompassing the entire biodiversity of these areas. As there is a potential impact pathway *via* the Blackwater River to both pNHAs, these sites are considered to be KER's.

5.3.2.2. Habitats & Flora

The River Blackwater in Mallow is *ca.* 30m wide and is characterised by moderately fast flowing glide habitat. The river substrate comprises predominately gravel-size material. A narrow woodland strip runs along both banksides, with adjacent lands comprising built infrastructure, agricultural lands, residences/gardens and parklands. The banks are steep-cut and *ca.* 2-4m high. On the left-hand bank, the land rises steeply into a cliff area of woodland /cliffs known as Lovers Leap. Trees on both banks include poplar *Populus* sp, ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus*, beech *Fagus sylvatica*, oak *Quercus robur* and willows *Salix* spp. A fringe of wetland herbs arise where the banks are less steep with species including reed canary grass *Phalaris arundinacea*, bur-reed *Sparganium erectum*, water speedwell *Veronica anagallis-aquatica*, water plantain *Alisma plantago-aquatica*, purple loosestrife *Lythrum salicaria* and water mint *Mentha aquatica*. The invasive species Himalayan balsam *Impatiens glandulifera* is common.

Figure 5.3 River Blackwater Upstream Of SW010

[9] *https://www.npws.ie/sites/default/files/publications/pdf/Goodwillie_1986_ASI_Cork.pdf*

Figure 5.4 River Blackwater Downstream Of SW010

Figure 5.5 River Blackwater - Gravel Substrate Visible In Foreground

Figure 5.6 River Blackwater In The Vicinity Of SW001

The overflow SW010 has been installed on an area of the right-hand bank together with rock armour. It flows into a deep/eroding section of the river. The primary discharge SW001 enters the river further downstream in an area where the channel is constrained by deposited gravels on the right-hand bank, with a deeper channel on the left-hand bank at the base of cliffs.

No instream vegetation could be seen in the River Blackwater at the time of visiting. The River Blackwater is designated for the Annex I habitat Floating River Vegetation as described in the EU Interpretation manual. NPWS (2019)[10] highlight that the common and widespread form of this habitat dominated by water crowfoot is considered to have low conservation value and indicate damage, with SAC's designated for rarer sub-types of this habitat. This habitat was not recorded during previous aquatic surveys (DixonBrosnan, 2019a). None of the habitats recorded during the current survey within the river or riparian margins align with the criteria for Annex I habitats. Alluvial woodland is likely to be presented upstream/downstream of Mallow, however the banks in the study area were too steep, and adjacent lands too modified, to support this habitat. The nearest area of alluvial woodland indicated on SAC mapping is at Killavullen *ca*. 12km downstream of Mallow (NPWS, 2012[11]).

The discharges are directly to the River Blackwater. The river habitat, in terms of its physical attributes and vegetation is of high quality in the reach within the ZoI of the discharges. While Annex I habitats were not observed in the survey area, they are likely to be present downstream due to the SAC designation. The River Blackwater habitat is therefore considered to be a KER of International Importance.

5.3.2.3. Fauna

Breeding Kingfisher has been recorded in Mallow area (NBDC), however no Kingfisher nesting sites were recorded by DixonBrosnan (2019b) within the study area during surveys for the sewerage scheme.

The NBDC holds records of Annex I species Kingfisher, Little Egret and Golden Plover (Annex I) from 2011, several Annex II waterbird species, and well as the Red-listed birds of conservation concern, Black-headed gull, Curlew , Herring Gull, Lapwing and Shoveler. Surveys undertaken for the sewerage scheme (DixonBrosnan, 2019b) recorded grey wagtail, a red-listed breeding species which is associated with river habitats. These birds of conservation importance could be sensitive to any eutrophication impacts affecting their ability to fish or forage, and are therefore considered to be a KER's of Local Importance (Higher Value).

There are records of Otter throughout the Blackwater River and tributaries, the latest NBDC record in the vicinity of Mallow being from 2013, with other studies identifying their

[10] NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol2_Habitats_Article17.pdf
[11] NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

widespread presence throughout the catchment (NPWS, 2019[12]; Reid et al, 2019[13]). While no signs of otter were found during the current survey, lack of access to private lands precluded a detailed survey. DixonBrosnan (2019b) recorded otter spraint and tar marks throughout the Blackwater river in Mallow during surveys for the sewerage scheme. An otter holt, considered to be a short-term resting area and unsuitable as a breeding holt, was identified in proximity to the works at SW010 requiring construction stage mitigation. Otter using the river are versatile feeders but could be affected by severe eutrophication impacts damaging fish stocks. As Otter are a qualifying interest of the SAC, this population is considered to be a KER of International Value.

There are records of invasive American Mink 2km upstream and 4km downstream of Mallow from 2013 (NBDC). As an invasive species, they are not considered as an ecological receptor in the context of this assessment.

There are records of Frog from 1994 (NBDC) in habitats adjacent to the river *ca.* 2km upstream Mallow, but they are not associated with the main river channel, and therefore not considered to be within the zone of influence of the project. Frog are not considered as ecological receptors due to their presence outside of the ZoI of the discharges.

White-clawed Crayfish were recorded *ca.* 3km upstream of Mallow in 2015, though none were recorded in the vicinity of Mallow during aquatic surveys for the sewerage scheme (DixonBrosnan,2019a). Otherwise the species is largely confined to the Awbeg subcatchment within the Blackwater system (NBDC; NPWS, 2012). While less sensitive to eutrophication than salmonid species, requiring Moderate water quality conditions, they would be sensitive to more severe eutrophication impacts. As Crayfish are a qualifying interest of the SAC, this population is considered to be a KER of International Value.

The River Blackwater in the vicinity of Mallow contains excellent habitat for all life stages of brown trout and excellent spawning and nursery habitat for salmon, sea trout and lamprey species. Surveillance monitoring for the CFB (now IFI) in 2009 (CFB, 2009)[14] at Killavullen Bridge (*ca.* 12km downstream of Mallow) recorded a total of 8 fish species. Dace was the most abundant species, followed by salmon, brown trout, gudgeon, minnow, stone loach, roach and European eel. IFI have also undertaken timed electro-fishing surveys of the River Blackwater as part of Catchment-Wide- Electro-Fishing Surveys (IFI, 2022[15]) to assess the distribution and abundance of salmon fry in selected catchments nationally. Based on the most recent 3 complete surveys (2007, 2008, 2016), the River Blackwater's index is 15.64 which does not meet the threshold index (17 salmon fry/5min) above-which it is considered that the rivers could open for angling on a catch and release basis.

Detailed aquatic surveys were carried out as part of the sewerage scheme planning application due to the requirement for instream works. These surveys, carried out by

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[12] *NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill*

[13] *Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.*

[14] *CFB (2009) Sampling Fish for the Water Framework Directive - Rivers 2009. South Western River Basin District Rivers.*

[15] *IFI (2022) Report on Salmon Monitoring Programmes 2021. Funded under the Salmon Conservation Fund. IFI/2022/1-4590) https://www.fisheriesireland.ie/sites/default/files/2022-03/report-of-salmon-monitoring-programmes-2021-funded-under-the-salmon-conservation-fund.pdf*

Ecofact in 2018 (Ecofact report in Appendix 9 of the NIS for the Scheme (DixonBrosnan, 2019a)), and by DixonBrosnan in 2019 as part of a further information request (Dixonbrosnan, 2019c (Appendix 3 of Appendix G)). The surveys concluded that there are extensive areas of suitable spawning and nursery micro-habitats for salmon, sea lamprey, river lamprey and brook lamprey. Habitat features present in the study area include spawning gravels, riparian tree and shrubs providing cover and enhancing food supply, silt beds along shaded banks for juvenile lamprey, and sufficient depth and continuous flow of water.

Salmon, trout, lamprey and eel are protected under the Fisheries Act (1959, as amended), with salmon and lamprey additionally protected under the Habitats Directive. These species would all be sensitive to eutrophication impacts. As salmon and lamprey are qualifying interests of the SAC they are considered to be KER's of International Importance. Trout and eel populations in the river are KER's evaluated as being of County Importance.

On the basis of past surveys, a scattered population of Freshwater Pearl Mussel is known to exist in the Blackwater between Mallow and Fermoy (DixonBrosnan, 2019b and references therein; NPWS, 2019). An updated survey was carried out in the area of interest for the sewage scheme in 2018 (Ecofact report in Appendix 9 of the NIS for the Scheme (DixonBrosnan, 2019a)). The report concluded the following:

Generally, the habitat in the study area and within the survey sections was considered to be unsuitable both for adult FPM and juvenile FPM recruitment. This is mainly due to heavy siltation, unsuitable and unstable substrate and eutrophication. Despite this, some small areas did contain some suitable freshwater pearl mussel habitat although it was not common. Occasional dead FPM shells were found throughout the survey area. However, only one live freshwater pearl mussel was found at the most downstream point of the study area, downstream of the existing outfall for the Mallow WwTP. It is possible that there are a small number of adult freshwater pearl mussels in this area that went undetected, however there is no significant population present here and there are no individuals present in the direct vicinity of the location where the works will be carried out. These results are similar to previous and most recent knowledge of the study area at Mallow, as demonstrated by studies completed by Ross (2014a; 2014b).

Freshwater Pearl Mussel are highly sensitive to eutrophication and siltation impacts, requiring clean gravel beds with minimal silts and macrophytes. Requirements for supporting conditions are set out in the Freshwater Pearl Mussel Regulations (S.I. No 296 of 2009) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. Freshwater Pearl Mussel is a qualifying interest of the Blackwater (Munster) SAC and while the core populations are present in the Allow and Licky sub-catchments, following legal challenge it has been clarified that the main channel is also designated for this species. Populations potentially present in the vicinity of Mallow are therefore considered KER's of International Importance. The current WFD objective of Good status for the River Blackwater does not align with the restoration of High water quality conditions required for Freshwater Pearl Mussel.

Table 5.3 Summary of Ecological Evaluation

Ecological Receptor	Ecological Valuation
Designated Sites	
Blackwater River (Cork/Waterford) SAC	International
Blackwater Valley (Killavullen) pNHA	National
Blackwater Valley (Ballinvurrig Wood) pNHA	National
Habitats & Flora	
Lowland Depositing River FW2	International
Fauna	
Otter	International
Birds	Local importance (higher value)
Salmon & lamprey	International
Trout & Eel	Local importance (higher value)
Freshwater Pearl Mussel	International
Other aquatic fauna (other fish & invertebrates)	Local importance (lower value)

5.4. Description of Likely Significant Effects

5.4.1. Overview of Potential Impacts

Given the discharges are all directly to the River Blackwater, the primary impact under consideration is the potential pollution of surface waters arising from the agglomeration discharges *(i.e.,* SW001 and SW010). Such impacts could include nutrient enrichment triggering algal or plant growth, deposition of sewage litter, growth of sewage fungus, deposition of organic sediments or zones of altered dissolved oxygen, pH or temperature levels.

According to the 2021 AER, the primary discharge from the WwTP is compliant with its ELV's with the exception of Ammonia. The WwTP upgrade has been designed to meet the current D0052-01 ELV for Ammonia (*i.e.*, 3mg/l). The assimilative capacity calculations demonstrate that based on background water quality, future loads and 95%ile flows that the ELV's are sufficient to ensure the WFD waterbody objective of Good status can be met. The WFD objective of Good status does not align with the restoration of High water quality conditions required for Freshwater Pearl Mussel. While there is no High status objective for this waterbody, the 2013-2018 status for Ortho-phosphate and Ammonia is High. The assimilative capacity calculations demonstrate that the proposed ELV's are sufficient to ensure the 95%ile EQS's for High status can be met for BOD, Ortho-phosphate and Ammonia.

The single SWO remaining in the upgraded sewerage network meets the required design criteria, and calculations based on network modelling indicates that this SWO would meet the UPM high-status discharge criteria for intermittent discharges. Provision has been made for storage and screening of SWO's. SWO's are a necessary part of sewerage networks and serve to prevent uncontrolled spillages arising within the agglomeration and to prevent the biological processes necessary to treat effluent being compromised by inundation with excess water. The principal consideration to take account of in the

assessment of the impact of overflows for water quality is that overflows will only occur in the event of sustained rainfall. The initial flushing flow arising from the first 5 mm of rain in a rainfall event is contained in the foul sump initially and will not be passed through to the storm tanks unless the capacity of the foul pumps is exceeded. This initial surface runoff flow will have the highest level of pollutants as it will wash in debris from impermeable surfaces and may dislodge settled solids in the sewer network. Flows entering a storm tank will then pass through a 6 mm upward flow screen between the foul sump and storm sump. This will further retain a significant proportion of the organic matter, solids and rags in the foul sump. Flows entering a stormwater holding tank will then be retained in the storm tank providing an opportunity for suspended solids to settle out. As flow recedes, the storm tank contents are passed forward to the WwTP for treatment. If the storm tank reaches capacity a highly diluted screened effluent is discharged. It is not possible to fully retain all stormwater due to septicity that arises with storage and the inability of treatment plant biological processes to cater for large volumes of dilute wastewater. Diluted, settled, and screened effluent that is discharged during storm conditions, will enter the river which will itself have increased flows driven by sustained rainfall. In this context, the discharges *via* SW010 to the large River Blackwater channel will be diluted and dispersed effectively.

The risks of sewer or outfall failure associated with extreme events resulting in the activation of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent Emergency Overflows that can be applied has been incorporated in the design and operation of the agglomeration.

5.4.2. Assessment Of Effects

This assessment focuses on the KER's identified for the Project *i.e.*, those ecological receptors of local (higher) value and above. In context of the impacts described above the assessment considers the nature of the effects that could arise and whether mitigation is required.

The wastewater discharge, considered in the context of background pressures, meets all the relevant Surface Water Regulation EQS's for High status. Biological water quality monitoring demonstrates that the river, in the context of the current operational discharges, achieves Good status upstream and downstream of Mallow, indicating no deterioration in the longer-term quality of the benthic fauna downstream, however localised impacts of sewer overflows could occur. The removal of 9 no. overflows and the improvements to the network will significantly reduce the volume and quality of intermittent discharges entering the river, addressing any localised impacts.

Good status conditions are sufficient to ensure that many pollution-sensitive aquatic species using the River Blackwater, including salmonids, lamprey and crayfish, are not affected by the discharges. Consequently, any less sensitive species will also remain unaffected as nutrient input *via* treated effluent from the WwTP, or diluted intermittent discharges, into the Blackwater river system would not impact water quality at a scale that would significantly affect the health, habitat or food sources of these species. Bird and mammal fauna identified as KER's such as Kingfisher and Otter which may rely on the

river and its aquatic fauna for habitat and food, will consequently also remain unimpacted by the discharges.

The Freshwater Pearl Mussel requires High status conditions as specified in the fourth schedule of the Freshwater Pearl Mussel (FPM) Regulations (S.I. No 296 of 2009) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. The EQR specified for macroinvertebrates of 0.90 relates to a Q Score of Q4-5, indicating High status water quality conditions. As noted earlier, the Q score upstream and downstream of Mallow is currently Q4 and the receiving water is assigned Good status. The assimilative capacity calculations however indicate that, under low flow conditions (worst case scenario), that High status water chemistry conditions can be achieved by the discharge in the receiving waterbody even in the context of background/upstream pressures.

It is noted that the Mallow agglomeration, prior to the upgrade being completed, was not listed as a pressure on its receiving waterbody. The removal of 9 no. SWO's and the provision of appropriate treatment of Ammonia, along with the proposed ELV for Ortho-phosphate, and the proposed design and operation of the Dual Function Overflow, SW010, will cause a reduction in overall nutrient input into the river system. Locally, this will have a slight positive long-term impact on the identified KERs i.e., the river habitat, aquatic fauna, otter and birds that rely on the river, and together with the RBMP measures tackling key pressures, will contribute toward the restoration of high status water quality conditions in the waterbody.

Given the proposed stringent ELV's and the network upgrades, the operational discharges will support the appropriate water chemistry conditions and will therefore not hinder the achievement of the FPM Regulation standards for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation, and consequently not significantly effect the Freshwater Pearl Populations in the River Blackwater.

Operational discharges do not have the potential to negatively impact upon any of the habitats or fauna identified as KER's *i.e.*, the river habitat, aquatic fauna, otter or birds that rely on the river. The downstream pNHA, which include the river habitat and its species considered herein, will also consequently remain unaffected. The AA Screening/NIS has demonstrated that the integrity of the SAC will not be affected.

5.5. Mitigation Measures

No significant effects to KER's have been identified. Mitigation measures to avoid or reduce the potential impacts of the Project on KER's are therefore not required.

To ensure continued satisfactory operation of the Mallow agglomeration in line with the discharge licence the authors recommend the following:

- Ensure that the capacity of the WwTP is not exceeded;
- Ensure all discharges continue to operate in compliance with the ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis.

5.6. Residual Impacts

Residual ecological impacts are those that remain once the proposals have been implemented. The main aim of ecological mitigation is to avoid, minimise or offset residual impacts following the mitigation hierarchy. As no potential significant effects have been identified from the operational discharges from the Mallow agglomeration (i.e., SW001 and SW010), and no mitigation measures prescribed, there are no residual significant effects.

5.6.1. Cumulative Impacts

Cumulative effects may arise from the effects (significant or otherwise) of the proposed Project in-combination with other plans or projects are provided below.

5.6.1.1. Plans

Plans of relevance include Irish Waters **Water Services Strategic Plan** (WSSP), the Cork County Development Plan, and the National River Basin Management Plan.

In 2015, Irish Water published the WSSP, a 25-year Plan which as well as detailing current and future challenges affecting water services, identifies priorities to be addressed in the medium term. Solutions in these priority areas are delivered through capital and other projects outlined in Irish Waters Investment Plan, a multi annual plan covering a five-year horizon, currently 2020-2024. The Mallow Sewerage Scheme Upgrade Project is included on Irish Water's current Capital Investment Plan.

Irish Water **Capital Investment Plan 2020-2024** – Proposals to upgrade and secure water services and water treatment services countrywide. This plan will result in positive cumulative effects with The Project.

The **Cork County Development Plan** 2022-2027 has been recently published. This new plan amalgamates the former municipal area regional plans into the main county plan. The plan has several relevant objectives and statements relating to wastewater:

- WM 11-1: EU Water Framework Directive and the River Basin Management Plan
    - *f) Support the prioritisation of the provision of water services infrastructure in: 1. Metropolitan Cork, the Key Towns and Main Towns to complement the overall strategy for economic and population growth while ensuring appropriate protection of the environment. 2. All settlements where services are not meeting current needs, are failing to meet the requirements of the Urban Wastewater Treatment Directive, and where these deficiencies are – interfering with Councils ability to meet the requirements of the Water Framework Directive; or – having negative impacts on Natura 2000 sites; and*
    - *g) Development may only proceed where appropriate wastewater treatment is available which meets the requirements of environmental legislation, the Water Framework Directive and the requirements of the Habitats Directive*
- Emission Limit Values (ELVs)
    - *11.5.15 In many instances, the Emission Limit Value standards set by the EPA when licensing treatment plants are significantly higher than the*

requirements of the Urban Wastewater Directive (UWWD). Some of these ELV standards cannot consistently be achieved even by relatively modern plants without significant upgrades. This is a national issue not unique to Cork but it occurs in several locations across the County.

- *11.5.16 In assessing the capacity of a WWTP to cater for future development where an ELV issue pertains, the assessment has been based on the hydraulic and organic loadings of the treatment plant relative to its design capacity on the assumption that the ELV issue will be resolved in an approach that will be determined/ agreed at a national level between Irish Water and the EPA.*

- Section 11.5.3 – 11.5.6 Highlight the issues regarding development planning and the High status objective for Freshwater Pearl Mussel in the River Blackwater.
- Section 11.9.5 The assimilative capacity of the County's waterbodies is not infinite, and it is considered important, when assessing individual development proposals involving abstraction or dilution of discharges, that sufficient assimilative capacity is retained so as to allow for the continued growth of the overall settlement and avoiding the unsustainable exploitation of the watercourse.
- With specific regard to the Mallow agglomeration the following objectives/statements are noted:
  - *Table 11.3: Future capacity subject to implementation of projects on the Irish Water Investment Plan (Revenue Control Period 3) or aligned programmes. Any development which would have an adverse impact will be put on hold until resolution of issues relating to impact on water quality in sensitive water catchments.*
  - *CS 2-7 (Mallow): Future growth of the town should be planned for on a phased basis in consultation with the Local Authority and Irish Water to ensure that sufficient wastewater capacity is accounted for and that further growth avoids negative impacts on the nutrient sensitive River Blackwater.*
  - *General Objective for Mallow MW-GO-02: In order to secure the sustainable population growth and supporting development proposed in MW-GO-01, appropriate and sustainable water and waste water infrastructure that will secure the objectives of the relevant River Basin Management Plan and the River Blackwater Special Area of Conservation, must be provided and be operational in advance of the commencement of any discharges from development. Waste-water infrastructure must be capable of treating discharges to ensure that water quality in the receiving water does not fall below legally required levels.*

Information on the **River Basin Management Plan** (2018-2021), Draft River Basin Management Plan (2022-2027), and associated information on the catchments available on www.catchments.ie was reviewed:

- The RBMP sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that Irelands natural waters are sustainably management and that freshwater resources are protected so as to maintain and improve Ireland's water environment. The Draft 3rd cycle plan, identifies that based on 2013-2018 data, 53% of surface waters are in/ good

or high ecological status while the remaining 47% are in unsatisfactory ecological status.

- Continued investment in wastewater infrastructure is highlighted as one of the key actions in the plans. The 3rd cycle plan and catchment report[16] does not identify any specific actions with respect to the Blackwater in the vicinity of Mallow.

5.6.1.2. Projects

Cork Co. Cork planning system was reviewed for any recent proposed or permitted projects that could lead to in-combination impacts with the Project. Several residential developments are at various stages in the planning system including those proposed by Hallmark Building Services Ltd. (206116, duration extended); Walsh Engineering Supplies (214648, granted), Oakfield Resources Ltd. (224497 , New application), Kildana Ltd. (224501, FI stage), Brookhill Investments Mallow Ltd. (224676, FI stage) and Hallmark Building Ltd. (224819, New application). There are also two notable solar farm developments by Amarenco Solar Mallow Ltd. (214498, duration extended) and Solar Farm Soleire Renewable SPV Ltd. (225681, FI Stage).

Dairygold Co-Operative Society Limited (P0403-03) is a milk processing facility which discharges treated process water from an on-site WwTP directly to the River Blackwater at NGR 155580E, 098056N, *ca.* 2km upstream of the Mallow WwTP primary discharge point. As part of their licence review in 2015, the EPA as the competent authority conducted an AA Screening and subsequent AA. The EPA determined based on best scientific knowledge in the field and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 and 2013, pursuant to Article 6(3) of the Habitats Directive, that the activity pertaining to the P0403 review, individually or in combination with other plans or projects (this would have included WWDL D0052-01), would not adversely affect the integrity of a European Sites in particular Blackwater River (Cork/Waterford) SAC having regard to its conservation objectives and will not affect the preservation of any European sites at favourable conservation status if carried out in accordance with the conditions set in IE licence. This determination was based on the stringent ELVs on the discharges to air in compliance with the Air Quality Standards Regulations 2011, the stringent ELVs on the discharge to water, to contribute towards high status water quality standards required by the Environmental Objectives Regulations, the requirement for a surface water run-off divert system, and also the significant dilution available in the receiving water, the River Blackwater.

Based on the above there will be no cumulative effects arising with any other plans or projects.

5.7. Monitoring

Monitoring of effluent and the receiving watercourse is specified by the EPA discharge licence (Reg: D0052-01). As specified in the licence, water quality will continue to be

[16] *https://catchments.ie/wp-content/files/catchmentassessments/18%20Blackwater%20(Munster)%20Catchment%20Summary%20WFD%20Cycle%203.pdf*

monitored to determine the impact of the discharge from the upgraded WwTP to ensure it complies with relevant legislation and the limits specified by the licence.

5.8. Conclusion

The resultant improvement in water quality of the Blackwater River is predicted to have a slight positive long-term impact on the identified Key Environmental Receptors *i.e.*, the river habitat, aquatic sensitive water dependent fauna, otter, and birds that rely on the river.

No negative effects upon Key Ecological Receptors are predicted to arise from the operational discharges associated with the Mallow agglomeration *i.e.,* SW001 and SW010.

There will be no cumulative effects arising with any other plans or projects.

6. WATER

6.1. Introduction

This Chapter, prepared by AWN Consulting Ltd, assesses and evaluates the likely significant effects associated with the operational discharges on the water environment. An overarching component of this Chapter will be assessing the impact of the operational discharges against the pertinent objectives of relevant Directives and Regulations, including but not limited to the WFD [2000/60/EC], UWWT Directive [91/271/EEC], and European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2022 [S.I No. 288/2022].

In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

Full details of the Project can be found in **Chapter 3**. A description of the Mallow Sewerage Scheme Upgrade Project can be found in **Section 1.2.2**.

The purpose of this Chapter is to:

- Describe and evaluate the baseline water environment relevant to the 2 no. operational discharges;
- Identify and assess all potentially significant effects on the surface water environment associated with the operational discharges;
- Set out the mitigation measures required to ensure compliance with relevant water legislation and to address any potentially significant effects;
- Provide an assessment of the significance of any residual effects; and
- Where relevant, identify any monitoring requirements.

6.1.1. Statement of Authority

This report was prepared by Colm Driver (BSc MSc PGeo EurGeol), and Teri Hayes (BSc MSc PGeol EurGeol). Colm is a Senior Hydrogeologist with over 5 years of experience in environmental consultancy and water resources studies. Colm is a professional member of the Institute of Geologists Ireland and European Federation of Geologists). He is also an active member of the Irish Group of the Association of Hydrogeologists (IAH).

Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is a professional member of the Institute of Geologists Ireland and European Federation of Geologists and has qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment, and environmental impact assessment.

6.2. Methodology

6.2.1. General

This Chapter evaluates the effects, if any, which the operational discharges will have on Hydrology as defined in the EPA '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EPA, 2022). The Draft EPA document entitled '*Advice Notes for Preparing Environmental Impact Statements*' (EPA, 2015) is also followed in this hydrological assessment and classification of environmental effects. In addition, the document entitled *'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*' by the TII, 2009 (previously NRA) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the hydrological environment is based on the standard EIAR impact predictions which takes account of the quality, significance, duration and type of effect identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

The duration of each effect is assigned as either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes during the EIA stage are also relevant in assessing the impact and are presented in **Appendix 1 – Criteria for Rating Site Attributes – Estimation of Importance of Hydrology Attributes, Table 1.**

6.2.2. Policy Context & Legislation

The WFD requires *'Good Water Status'* for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. '*Good status*' means both *'Good Ecological Status'* and *'Good Chemical Status'.* In 2009 the Eastern River Basin District (ERBD) River Management Plan (RMP) 2009-2015 was published. In the ERBD RMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (*e.g.,* water regulation structures).

This second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations).

Water bodies identified as being '*At Risk'* of not achieving their environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. The manner and the timeframe in which these targeted measures are implemented need to be prioritised to take account of the finite resources available and of the time and resources needed to develop appropriate measures.

During the development of this Plan, a prioritisation exercise was undertaken by the local authorities, the EPA, and other stakeholders to identify those water bodies that require

immediate action within this plan cycle to 2021. During the catchment characterisation, the EPA identified those water bodies either *'At Risk'* of not achieving their objectives or *'Under Review'*. The outcome of this prioritisation process was the selection of 190 Areas for Action across the 5 Local Authority regions. Within these 190 areas, a total of 726 water bodies were selected for initial actions during this RBMP cycle. There are 832 water bodies identified as being *'At Risk'* of not achieving their environmental objectives under this Plan that have not been included in the Areas for Action. For most of these water bodies, targeted actions will be undertaken in the third cycle RBMP from 2022-2027. The draft 3rd cycle RBMP has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the operational discharges from the Mallow agglomeration.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014) and amended in 2017 (S.I. No. 464/2017);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009) & 2015 (S.I. No. 386 of 2015) & S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019, & S.I.288 of 2022;
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) & 2016 (S.I. No. 366 of 2016);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010);
- European Communities (Good Agricultural Practice For Protection of Waters) Regulations 2022 (S.I. No. 113 of 2022); and
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011)

6.2.3. Sources of Information

This assessment was considered in the context of the available baseline information, potential impacts, consultations with statutory bodies and other parties, and other available relevant information. In collating this information, the following sources of information and references were consulted:

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area;
- River Basin Management Plan for Ireland 2018-2021.
- Draft River Basin Management Plan for Ireland 2022-2027.
- Cork County Development Plan 2022-2028.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW);

- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council; and
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

6.2.4. EIAR Scoping

As outlined in **Section 2.3,** IW issued a request to the EPA on the 30th August 2022 for a Scoping Opinion on the scope and level of detail to be included in an EIAR for the Mallow WWDL (D0052-01) review. In accordance with the requirements of Regulation 17C & 17D of the European Union (Waste Water Discharge) Regulations 2007 to 2020 (WWD Regulations), the EPA consulted with the relevant prescribed bodies under Regulation 21(1) of the above referenced WWD Regulations. One scoping response was received from Cork County Council. The other prescribed bodies did not provide a response within the timeframe set out.

In relation to Ecology & Water, Cork County Council's submission stated the following:

> *The proposed operational discharges will discharge in the Blackwater (Munster)_130 and Blackwater (Munster)_140, both of which have a WFD 2013-2018 designation of "GOOD" status. The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (Margaritifera margaritifera) catchment under the First Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) and is also a Special Area of Conservation designated for the protection of a range of freshwater species and habitats. The EPA as competent authority to confirm through the EIA and AA processes that licence emission limit values are established at limits which can ensure that Ecological Quality Objectives as set out in the fourth schedule of the FWPM Regulations can be maintained, and that the Conservation Objectives for all qualifying interests of the Special Area of Conservation are also met.*

The scope of this Chapter and assessment contained therein has taken full regard of the above submission.

6.3. Receiving Environment

6.3.1. Existing Environment

The WwTP is located on the east side of Mallow town on the banks of the Blackwater River. The new Bridge Street Pumping Station is located at Bearforest Lower, west of the WwTP, and also on the banks of the River Blackwater.

The agglomeration operational discharges to the River Blackwater are presented below (**Table 6.1**). These include the primary discharge from the upgraded WwTP (SW001) and 1 no. Dual Function Overflow which can function as a Storm Water Overflow (SWO) or Emergency Overflow (EO), depending on the event. They both enter the Blackwater (Munster)_140 waterbody which is assigned Good WFD status (2013-2018 & 2016-2021). For 2013-2018, both Ammonium and Ortho-phosphate are noted as High under WFD status. There are no significant pressures identified for this waterbody.

Table 6.1 Operational Discharges Relating To The Mallow WWDA Review

New Discharge Name	Type	Asset	Discharge Location (NGR)
SW001	Primary Discharge	WwTP	157530E 098140N
SW010*	Dual Function Overflow (Storm Water Overflow & Emergency Overflow)	New Bridge Street Pumping Station	156636E 097862N

Scoping has identified the impact of the operational discharges (SW001 and SW010) on the receiving surface waters as being the only likely potential significant environmental impact on water quality. As a consequence, the existing environment to be assessed is limited to Blackwater (Munster) River.

6.3.2. Receiving Surface Waters

The agglomeration discharges directly to the Blackwater River (Blackwater (Munster)_140), refer to **Figure 6.1**, and **Chapter 3** for a full description of the operational discharges from the Mallow Agglomeration.

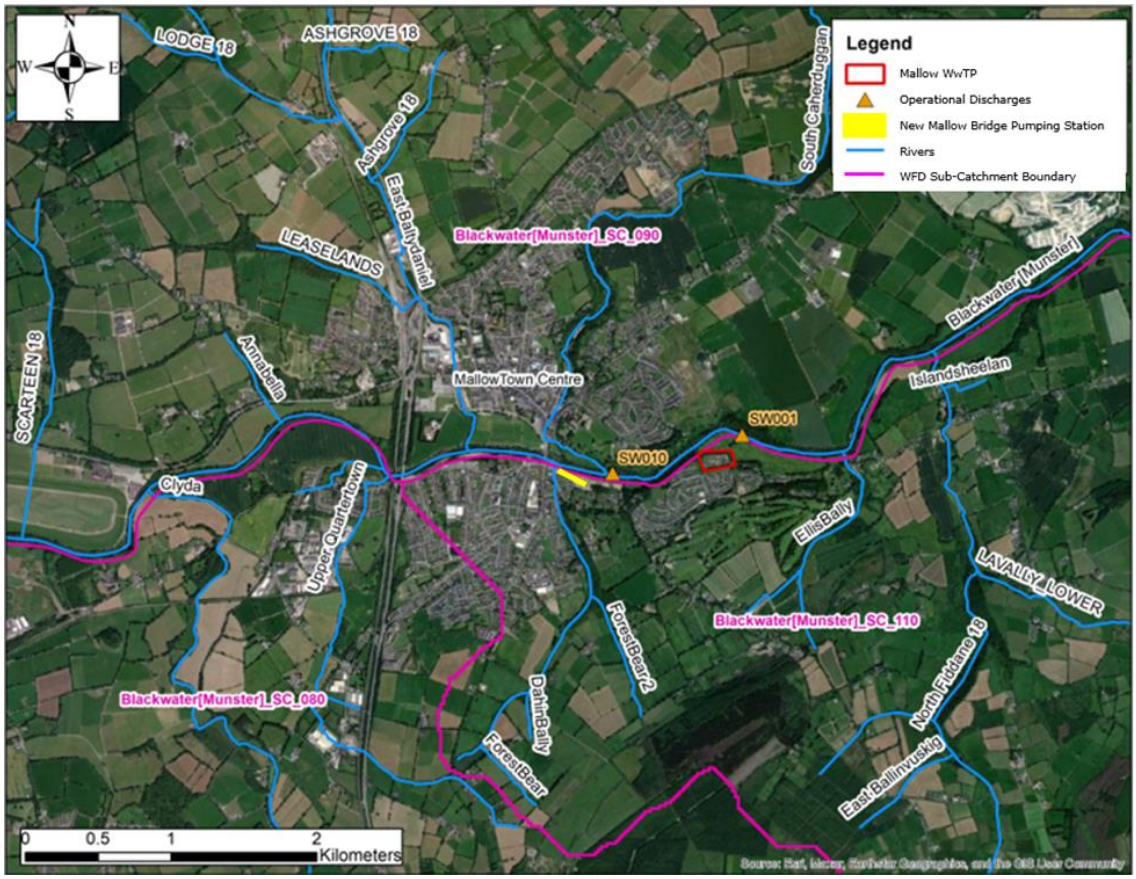

Figure 6.1 Local Hydrological Environment (EPA, 2022)

6.3.2.1. Surface Water Quality

The operational discharges are located within the former South Western River Basin District (SWRBD, now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 18 (Blackwater (Munster)) of the Irish River Network.

The Blackwater River is designated as a Salmonid River (Blackwater [Munster) under European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988). It is also designated as a nutrient sensitive area in accordance with the UWWT Directive 91/271/EEC on Urban Waste Water Treatment and S.I. No. 254 of 2001, S.I. No. 440 of 2004 and S.I. No. 48 of 2010, with P being the limiting nutrient in this waterbody. Refer to **Figure 6.4** and **Figure 6.5,** respectively.

Figure 6.2 below presents the EPA quality monitoring points in the context of the 2 no. operational discharges and other regional drainage settings.

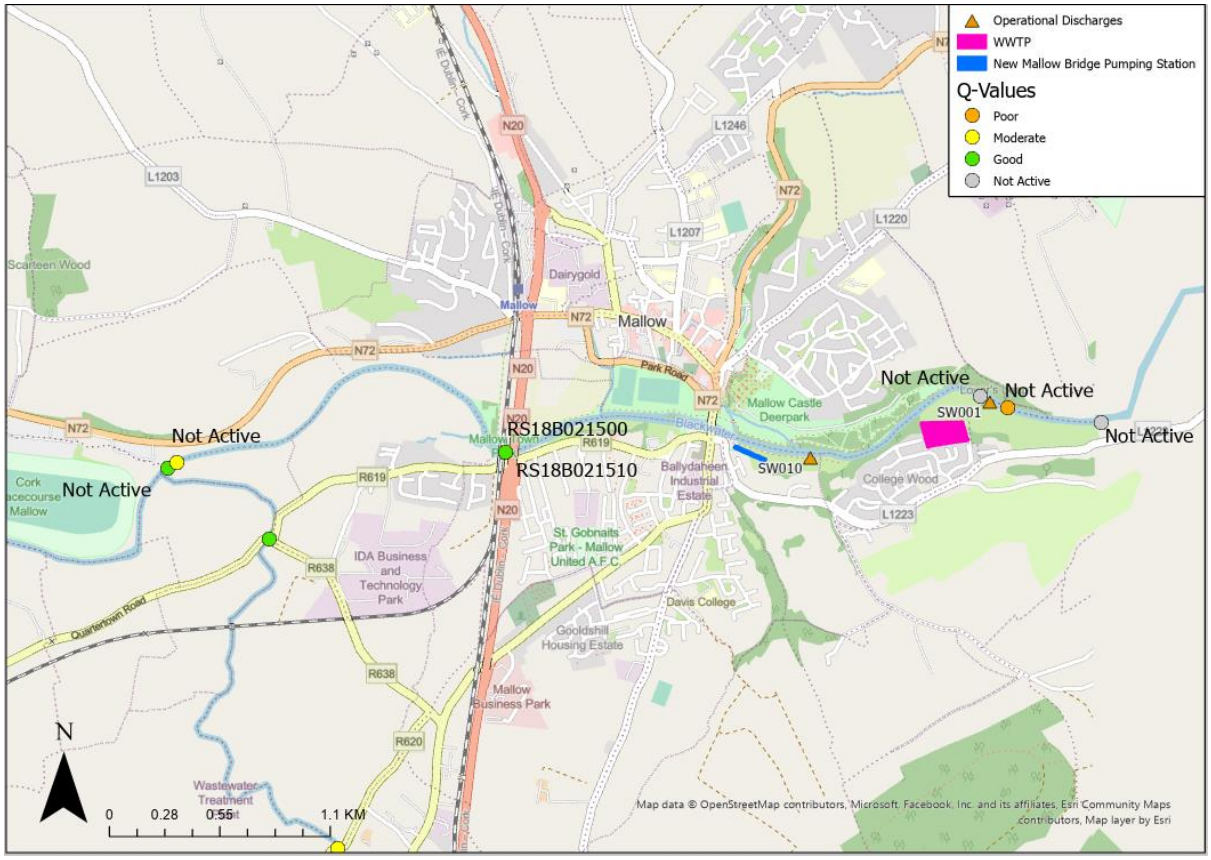

Figure 6.2 Surface Water Quality Monitoring Points (EPA,2022)

Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the site setting, the nearest EPA monitoring station is situated along the Blackwater (Munster) River (RS18B021510, which is located *ca.* 2.4km west [upstream] from discharge point SW001). The EPA assesses the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality

and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality. There are three (3) no. water quality monitoring stations located along the Blackwater River upstream and downstream of the Mallow Wastewater Treatment Plant (WwTP) which have quality ratings available within the last ten years. The first of these (Rly Bridge, Mallow (LHS) RS18B021500) obtained a Q4 – Good Status (in 2021), the second station (Rly Bridge, Mallow (RHS), RS18B021510) was Q3-4 – Moderate Status at last measurement (2021) and the third station is downstream of the Mallow WwTP (North-east of Ballymagooly, RS18B021800) obtained a Q4 – Good Status in 2020.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. Currently, the EPA classifies the WFD Ecological Status for the Blackwater (Munster) waterbody (IE_SW_18B021720, 18_2381) as having '*Good Status'* (2013-2018 & 2016-2021) with a WFD River Waterbody risk score of *Not At Risk of Not Achieving Good Status.* Furthermore, the Blackwater (Munster) (IE_SW_18B021900) waterbody changes status to *Moderate* approximately 2.3km downstream from the primary discharge point (SW001). **Figure 6.3** presents the operational discharge points of the Mallow WwTP and the WFD Status' of the surrounding waterbodies.

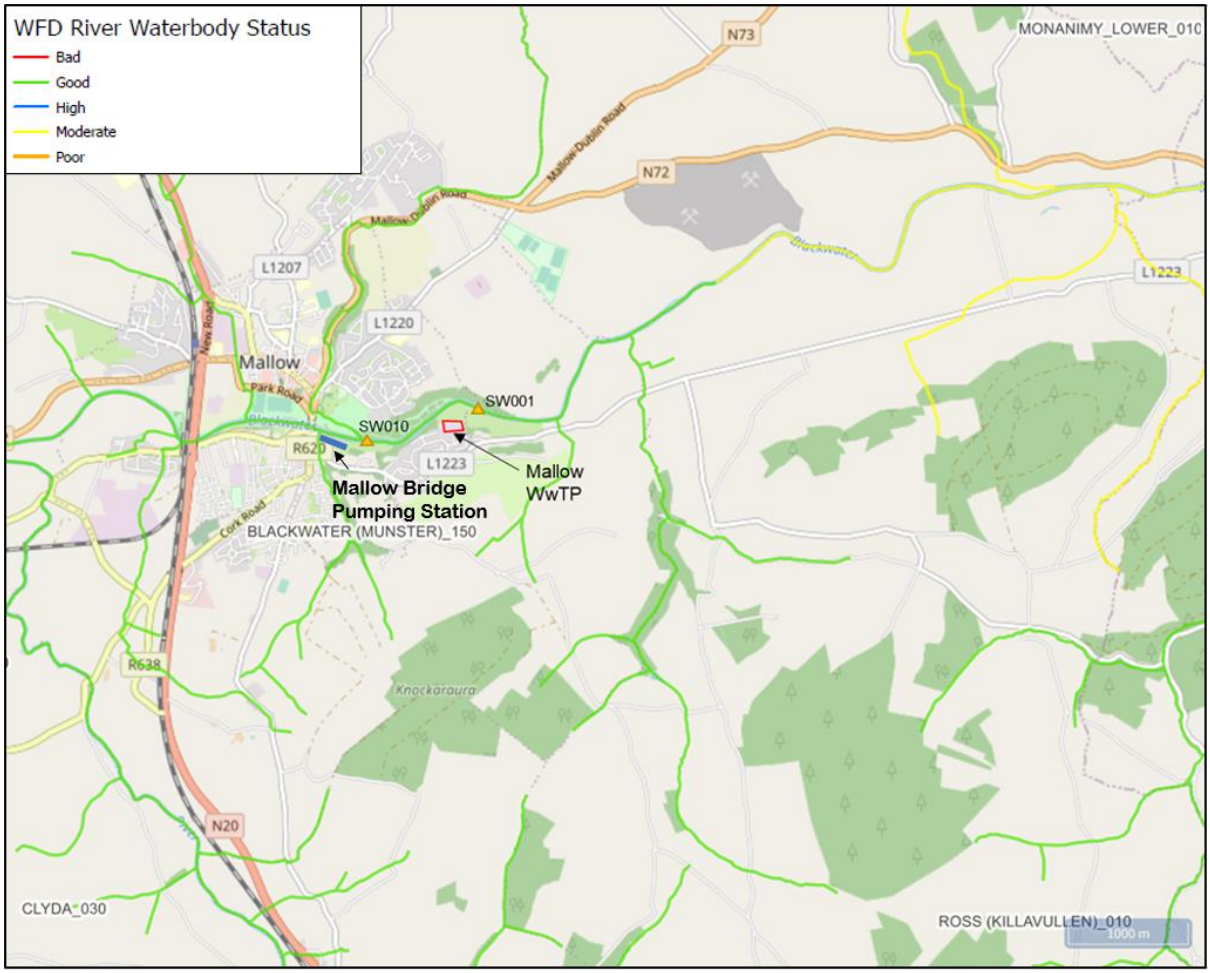

Figure 6.3 Operational Discharges Relating to D0052-01 WWDL Review and WFD Status of The Surrounding Waterbodies

Water chemistry is monitored by Cork Co. Council / EPA at:

- RS18B021600 (Mallow Br) - *ca.* 500m upstream of SW010;
- RS18B021690 (1.2km d/s Mallow Br (u/s STW)) - *ca*. 50m upstream of SW001; and
- RS18B021720 (Downstream of TPEFF0500D0052SW001) - *ca.* 560m downstream of SW001.

The most recent 18 months of data for key parameters are shown in **Table 5.2** in **Chapter 5.** Results were compared with the EQSs specified in the Surface Waters Regulations 2009 (as amended). Generally, at least Good status conditions are met upstream and downstream of the discharge with occasional exceedances. On most sampling occasions the results meet the High status limit. The current WFD target objective for the waterbody is to maintain Good status. The River Blackwater is a salmonid river for which the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293 of 1988) apply, and based on the parameters presented in **Table 5.2** the requirements of these regulations are also met (suspended solids were not monitored).

Figure 6.4 presents the EPA designated Salmonid River while **Figure 6.5** presents the nutrient sensitive area for Blackwater waterbody.

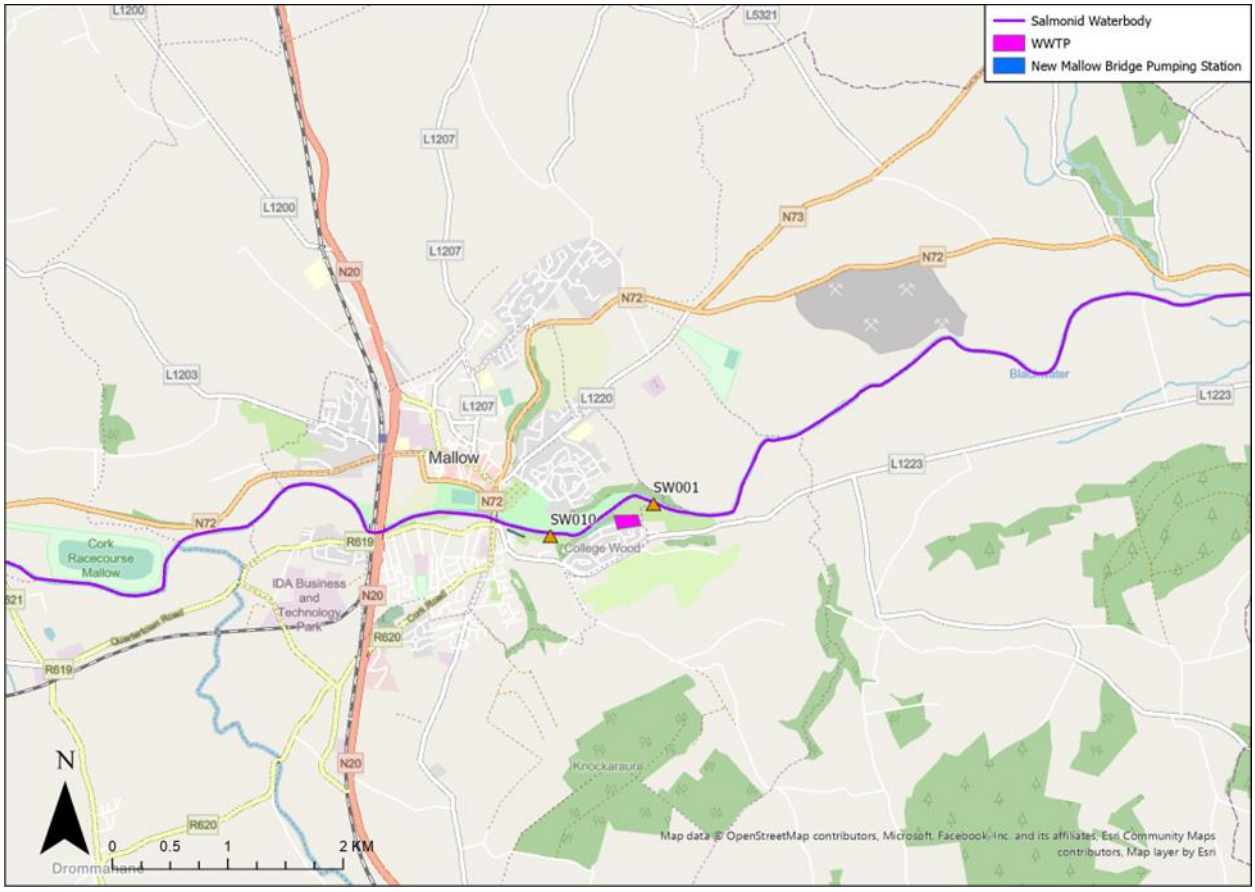

Figure 6.4 Salmonid Designation for The Blackwater Waterbody.

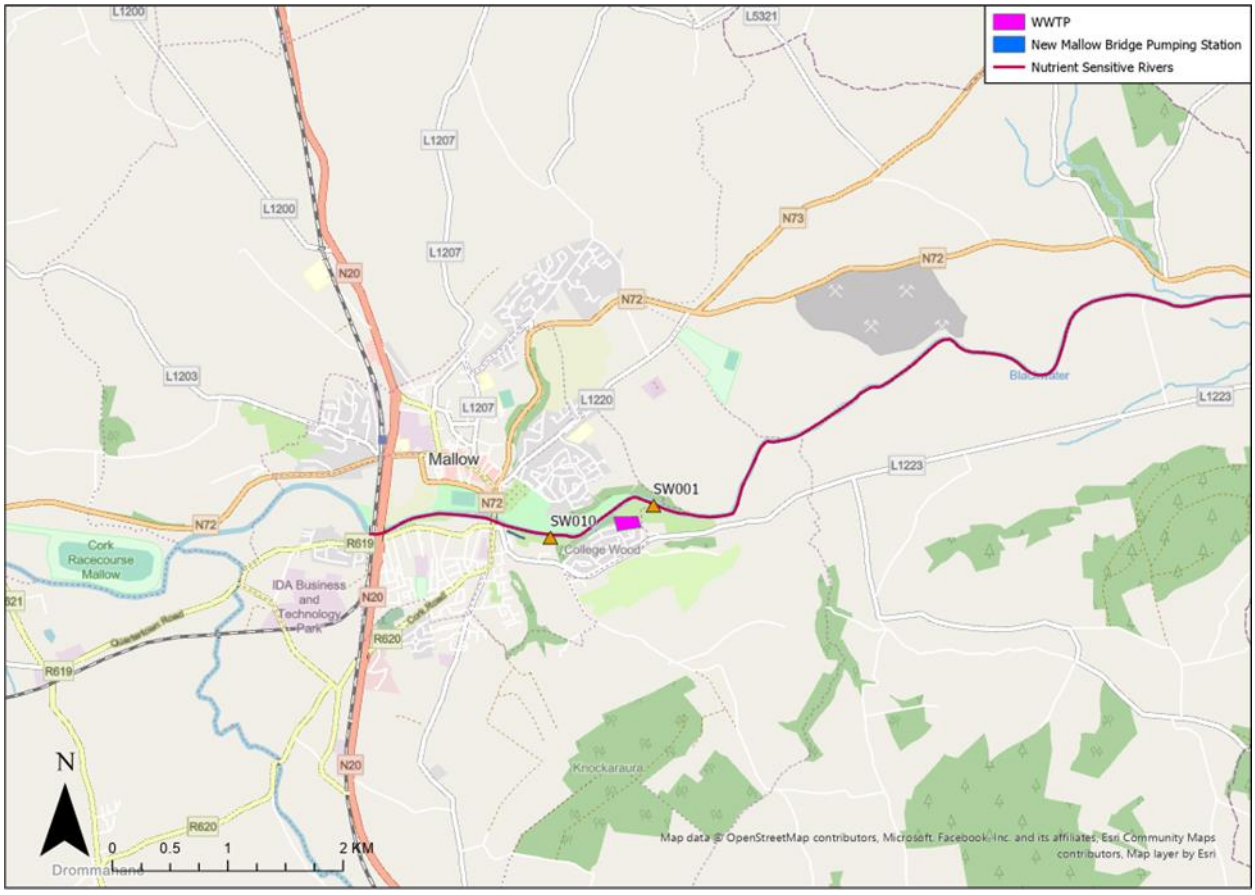

Figure 6.5 Nutrient Sensitive Area for the Blackwater waterbody.

6.3.2.2. Dual Function Overflow

Surface water flooding associated with heavy rainfall and exceedance of the drainage system is also a problem in Mallow town. The Mallow Sewerage Scheme Upgrade Project will increase flow capacity in the system, reduce sewage discharges to the Blackwater (Munster) River and will reduce surcharging of drainage pipe networks in the town.

On completion of the Networks Upgrade Contract, which will remove 9 no. SWO's from the agglomeration, there will be a single remaining Dual Function Overflow (SW010) in the agglomeration from Bridge Street Pumping Station which will operate as a SWO or an EO. The SWO has been designed to operate to meet the definition of '*Storm Water Overflow*' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995.

The Mallow Sewerage Scheme Upgrade Project is included on Irish Water's current Capital Investment Plan. Full details of the Mallow Sewerage Scheme Upgrade Project are provided in **Chapter 1** of this EIAR.

As described in **Chapter 3**, this work will cater for the increased flow from the network and will include a new Stormwater Holding Tank, a new Pumping Station, rising main and upgrades to the WwTP (increasing to a design p.e. 22,000). This contract was awarded in May 2021 and works are ongoing with an estimated completion date of December 2023.

Further information was submitted with the Mallow Sewerage Scheme Upgrade Project planning application in response to a query regarding the impact of an overflow during low river flow conditions (TJ O'Connor & Associates, 2019). This theoretical exercise considered a '*worst case scenario'* 1 year storm event. Using the network model a storm event that resulted in the highest flow through the overflow stormtank was selected. Based on future loads, a series of mass balance calculations was carried out. The predicted resultant concentrations in the river meet the Urban Pollution Manual 99 %ile standards as applicable to WFD High status waters. In reality, the scenario modelled was highly conservative and unlikely to arise as it did not consider any additional flows to the river from the catchment which would occur in a storm event (thus providing greater dilution).

The risks of sewer or outfall failure associated with extreme events resulting in the activation of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent Emergency Overflows that can be applied has been incorporated in the design and operation of the agglomeration.

6.3.2.3. Rating of site importance of the hydrological features

Based on the NRA methodology (refer to **Appendix 1 - Criteria For Rating Site Attributes – Estimation Of Importance Of Hydrology Attributes, Table 2**), for rating the importance of hydrological features, the importance of the hydrological features at this site is rated as ***High Importance***.

The Blackwater (Munster) River is the receiving waterbody for the operational discharges, it is not a source of local potable water, and is not widely used as a local water amenity *i.e.*, it is not regionally significant as per National Roads Authority, NRA (now TII), guidelines.

6.4. Characteristics of the Proposed Development

As described in **Chapter 3**, the subject matter of this EIAR comprises the operational discharge activities from the Mallow agglomeration after the completion of the Mallow Sewerage Scheme Upgrade Project. Therefore, this document is only concerned with the likely significant effects on the receiving environment associated with the operational discharges (SW001 & SW010) from the Mallow agglomeration. Demolition and construction related impacts are not relevant to this EIAR process.

6.5. Potential Impacts of the Development

The potential impacts from the operational discharges from the Mallow agglomeration are outlined below and the assessment of effects defined based on the description of effects as set out in the EPA EIA Report Guidelines (2022) and the NRA criteria detailed in **Appendix 1 - Criteria For Rating Site Attributes – Estimation Of Importance Of Hydrology Attributes**.

6.5.1. Operational Discharges

There are 2 no. operational discharges associated with the Mallow WWDA Licence Review, namely SW001 and SW010. These are described in full in **Chapter 3**.

An assimilative capacity assessment was carried out by Nicholas O'Dwyer (**Appendix 2 – Waste Assimilative Capacity Calculations**) to examine the dilution and the capacity of the Blackwater (Munster) River to receive the treated discharge without impacting the waterbody. The definition of assimilative capacity, as used by the EPA, is '*the ability of a body of water to cleanse itself; its capacity to receive waste waters or toxic materials without deleterious effects and without damage to aquatic life or humans who consume the water'*.

Calculations based on a conservative discharge scenario (*i.e.*, Q95 flow (4.87 m^3/s) of the Blackwater (Munster) River and the proposed dry weather flows (DWF) from the treatment plant show that the assimilative capacity would not exceed the established threshold values for Biological Oxygen Demand (BOD), Total Ammonia and Ortho-phosphate in the receiving Blackwater (Munster) waterbody in order to achieve '*High*' status.

Regarding the current assigned WFD status for Blackwater (Munster) waterbody, it is not expected that treated effluent from the upgraded Mallow WwTP will affect this classification. Furthermore, the quality of the treated effluent is monitored on the basis of actual discharge activities as per the associated EPA licence.

Discharges into the Blackwater (Munster) River will be at a controlled rate to ensure that there is no increase in flow during these discharges so there will be no change to the morphology of the river and any increase in downstream flooding will be avoided.

6.5.2. Overflows

There will be one Dual Function Overflow (SW010) at the Bridge Street Pumping Station *i.e.*, an overflow which can act as a SWO or as an EO depending on the event.

As mentioned above, this SWO has been designed to meet the definition of '*Storm Water Overflow*' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended, and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995.

During the operation of the WwTW, there is potential for unintended discharges during a storm event due to the presence of combined sewers in Mallow Town which discharge *via* pumping stations to the Mallow WwTP.

During storm events, surface water and a portion of foul water can accumulate which results in storm overflows which ultimately discharges into the Blackwater River. As outlined in **Chapter 3**, SWO's are a necessary part of sewerage networks and serve to prevent uncontrolled spillages from arising within the agglomeration and to prevent the biological processes necessary to treat effluent from being compromised by inundation with excess water. The principal consideration to take account of in the assessment of the impact of overflows for water quality is that overflows will only occur in the event of sustained rainfall.

The initial flushing flow arising from the first 5 mm of rain in a rainfall event is contained in the foul sump initially and will not be passed through to the storm tanks unless the capacity of the foul pumps is exceeded. In the event that the storm water tank is at

capacity (>2,400m^3) an overflow from the storm tank will be discharged to the River Blackwater *via* the new SWO (SW010 – NGR 156636E, 097862N). Level probes will control the flow in and out of the storm tank. This high-level overflow will be capable of conveying the full storm flow of 3,500 l/s and shall not permit backflow from the storm tank to the storm sump. Overflows to the storm water storage tank will be screened *via* a self-cleaning mechanical screen with a maximum passage of 6mm. This will further retain a significant proportion of the organic matter, solids and rags in the foul sump. Flows entering the stormwater holding tank will then be retained in the storm tank providing an opportunity for suspended solids to settle out.

As flow recedes, the storm tank contents are passed forward to the WwTP for treatment. If the storm tank reaches capacity, a highly diluted screened effluent is discharged. It is not possible to fully retain all stormwater due to septicity that arises with storage and the inability of treatment plant biological processes to cater for large volumes of dilute wastewater. In this context, the discharges *via* SW010 to the large River Blackwater channel will be diluted and dispersed effectively.

As mentioned previously the risks of sewer or outfall failure associated with extreme events resulting in the activation of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent Emergency Overflows that can be applied have been incorporated in the design and operation of the agglomeration.

These overflows are temporary (short-lived) and have no long-term negative impact on the waterbody quality.

6.5.3. Summary of Operational Discharges

A summary of operational discharge impacts for The Project following EPA (2022) EIA guidelines are provided below.

The Mallow agglomeration, prior to the upgrade being completed, was not listed as a pressure on its receiving waterbody. The removal of 9 no. SWOs and the provision of appropriate treatment of Ammonia, along with the proposed ELV for Ortho-phosphate, and the proposed design and operation of the Dual Function Overflow, SW010, will result in a reduction in overall nutrient input into the river system. Given the proposed stringent ELVs and the network upgrades, the operational discharges will support the appropriate water chemistry conditions and will therefore not hinder the achievement of the Freshwater Pearl Mussel (FWPM) Regulation standards (High Status). The removal of 9 no. overflows and the improvements to the network will significantly reduce the volume and improve the quality of intermittent discharges entering the river, addressing any localised impacts.

6.6. Mitigation Measures

No significant negative effects to the Water Environment have been identified. Mitigation measures to avoid or reduce the potential impacts of the Project on the water environment are therefore not required.

To ensure continued satisfactory operation of the Mallow agglomeration in line with the discharge licence the authors recommend the following:

- Ensure that the capacity of the WwTP is not exceeded;
- Ensure all discharges continue to operate in compliance with the ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis.

6.7. Residual Impacts

Residual impacts are those that remain once the proposals have been implemented. The main aim of mitigation is to avoid, minimise or offset residual impacts following the mitigation hierarchy.

In terms of the operational discharges, this assessment has considered the current water status of all relevant water bodies (**Section 6.3.2.** above), and potential impacts have been considered (**Section 6.5** above). With the design measures (as described in **Chapter 3)** in place, it is concluded that there will be no degradation of the current water body status (chemically, ecologically and quantitatively) or its potential to meet the requirements and/or objectives and measures in the second [current] RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027. It is noted that the Mallow agglomeration, prior to upgrade being completed, was not listed as a pressure on its receiving waterbody. The primary discharge (SW001) will be adequately treated *via* proper treatment measures (*i.e.* Primary & Secondary treatment with Phosphorous and Nitrogen removal) within the WwTP. This along with the proposed more stringent ELV for Ortho-phosphate will have a slight long-term positive impact to the WFD water quality status of the receiving watercourse.

During storm conditions, any discharges from SW010 will be diluted, settled, and screened prior to being discharged. The stormwater will enter the river which will itself have increased flows driven by sustained rainfall. In this context, the discharges *via* SW010 to the large River Blackwater channel will be diluted and dispersed effectively and will have no-long-term negative impact to the WFD water quality status of the receiving watercourse.

In terms of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), they are not reasonably predicted to occur. Should they occur however, these overflows will be temporary (short-lived) and have no long-term negative impact on the waterbody quality.

A site-specific detailed WFD Screening Assessment was carried out for the operational discharges and is attached as **Appendix 3 – Water Framework Directive Screening Assessment.** The WFD Screening Assessment has shown that there is no potential for change in the water body status and risk as a result of the operation discharges.

In summary, no potential significant negative effects have been identified from the operational discharges from the Mallow agglomeration (*i.e.*, SW001 and SW010). However, locally there will be a slight positive, long-term effect for the reasons as outlined above. As there are no negative residual significant effects, no mitigation measures have been prescribed.

6.7.1. Cumulative Impacts

The operational discharges from the Mallow agglomeration will be compliant with the pertinent objectives of relevant Directives and Regulations, including but not limited to the WFD [2000/60/EC], UWWT Directive [91/271/EEC] and European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2022 [S.I No. 288/2022].

Refer to **Chapter 5, Section 5.6** for further details.

There are no cumulative impacts with other plans and projects predicted.

6.8. Monitoring

Section 3.5.3 of this EIAR has detailed general "*Measures to Prevent Unintended Discharge*". The general measures below will be implemented which will subsequently act as monitoring measures to prevent significant negative effects on the water environment.

- The works will include the installation of a new SCADA and telemetry system, this system will ensure compliance and compatibility with IW's Design Specifications.
- All flows will be monitored continuously and recorded at the electromagnetic flowmeters.

Monitoring of effluent and the receiving watercourse is specified by the EPA discharge licence (Reg: D0052-01). As specified in the licence, water quality will continue to be monitored to determine the impact of the discharge from the upgraded WwTP to ensure it complies with relevant legislation and the limits specified by the licence.

6.9. Conclusion

This Chapter has assessed the impact of the operational discharges against the pertinent objectives of relevant Directives and Regulations. The Mallow WwTP has been designed to ensure that the emissions from the agglomeration will comply with and will not result in the contravention of EU Legislation and National Regulations.

The discharge standard will not compromise the achievement of the objectives and EQSs established for any European sites' water dependant species and natural habitats and designations in the wider environs or downstream of the agglomeration. The operation of the upgraded WwTP and network is expected to have a positive impact in terms of a reduction in the levels of nutrients being discharged in the Blackwater River. The discharge activities will not cause a deterioration in the chemical status in the Blackwater River.

No negative effects on the water environment are predicted to arise from the operational discharges associated with the Mallow agglomeration *i.e.,* SW001 and SW010. However, it is predicted that there will be a slight positive long-term effect on the receiving waterbody *i.e*. Blackwater River.

7. POPULATION & HUMAN HEALTH

7.1. Introduction

This Chapter, prepared by Enviroguide Consulting, of the EIAR considers the potential effects of operational discharges on human beings, living, working and visiting in the vicinity of the Mallow agglomeration. This Chapter details the potential direct and indirect effects of the discharges on Population and Human Health. It also examines the socio-economic impacts focusing on pertinent issues such as residential amenity, economic activity, tourism, and population levels.

One of the principal concerns for any development is ensuring that the local population experiences no reduction in the quality of life as a result of the development on either a permanent or temporary basis.

The Chapter on Population and Human Health is broad ranging and covers the existence, wellbeing, and activities of people living in the area through the format of considering people as '*groups'* or '*populations*'. The assessment of impacts on human beings involves the identification of relevant key populations that may be affected by the proposal and quantifiable documentary research. Health, as defined by the World Health Organization (WHO), is "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*".

Key populations have been identified as persons residing and engaging in activities near the operational discharges, persons with a stake in the general economy of the local and regional area, and persons enjoying the recreational and cultural amenities of the area.

7.1.1. Statement of Authority

This Chapter was prepared by Louise Hewitt, Environmental Consultants, Enviroguide Consulting. Louise has a Master of Science (Hons) in Environmental Resource Management from University College Dublin and a Bachelor of Science (Hons) in Biology from Maynooth University. Louise has worked as an Environmental Consultant with Enviroguide since 2021 and has significant experience preparing Environmental Impact Assessment (EIA) Screening Reports, Introduction, Population and Human Health and Archaeology and Cultural Heritage Chapters of EIARs.

This Chapter was reviewed by Janet O'Shea who has 16 years professional environmental experience. Janet who is Technical Director of EIA holds a BSc in Environmental Health and Diploma in Environmental Impact Assessment. Janet is a Lead Environmental Auditor (IEMA Approved), a Chartered Waste Manager (MCIWM) and Chartered Environmentalist (C. Env). Janet has authored and reviewed various EIAR Chapters including Population and Human Health since 2014. Janet has been part of the Design Team for multiple large-scale development, and has project managed the preparation of EIARs for various large-scale developments.

7.2. Methodology

A desk-based study was undertaken in October 2022 to assess information regarding population, age structure, economic activity, employment, and unemployment within the vicinity of the operational discharges.

The 2022 Census of Ireland was held on Sunday the 3rd of April 2022. The preliminary results were released on the 23rd of June 2022; however, the full suite of results will be published over several months starting in April 2023. The preliminary 2022 census results have been reviewed; however, they do not contain the required region-specific information for the purposes of this assessment of demographic profile. As such, the more robust and complete 2016 census results have been used in this assessment (accessed October 2022). The remaining information analysed as part of the desktop study was accessed in October 2022. The scope of the evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and any relevant EIARs that are in the public domain. The aim of the desktop study was to determine the current baseline environment.

The potential impact of The Project on the local population is assessed in this EIAR in relation to:

- Population;
- Socio Economic status;
- Tourism and Amenity;
- Air quality;
- Water;
- Noise;
- Traffic; and
- Risk.

In line with the EPA "*Guidelines on the information to be contained in Environmental Impact Assessment Reports*" (EPA, 2022), the terms are defined in **Section 2.5** when quantifying the quality of effects. Refer also to **Table 2.** in **Chapter 2**.

7.2.1. Study Area

The Project area is located in Mallow North Urban and Mallow South Urban Electoral Division (ED) which are both in the Mallow Local Electoral Area (LEA) (**Figure 7.1**). For the purpose of this chapter the town of Mallow has been selected as the study area. Mallow is a town in County Cork which is located approximately 30km north of Cork City.

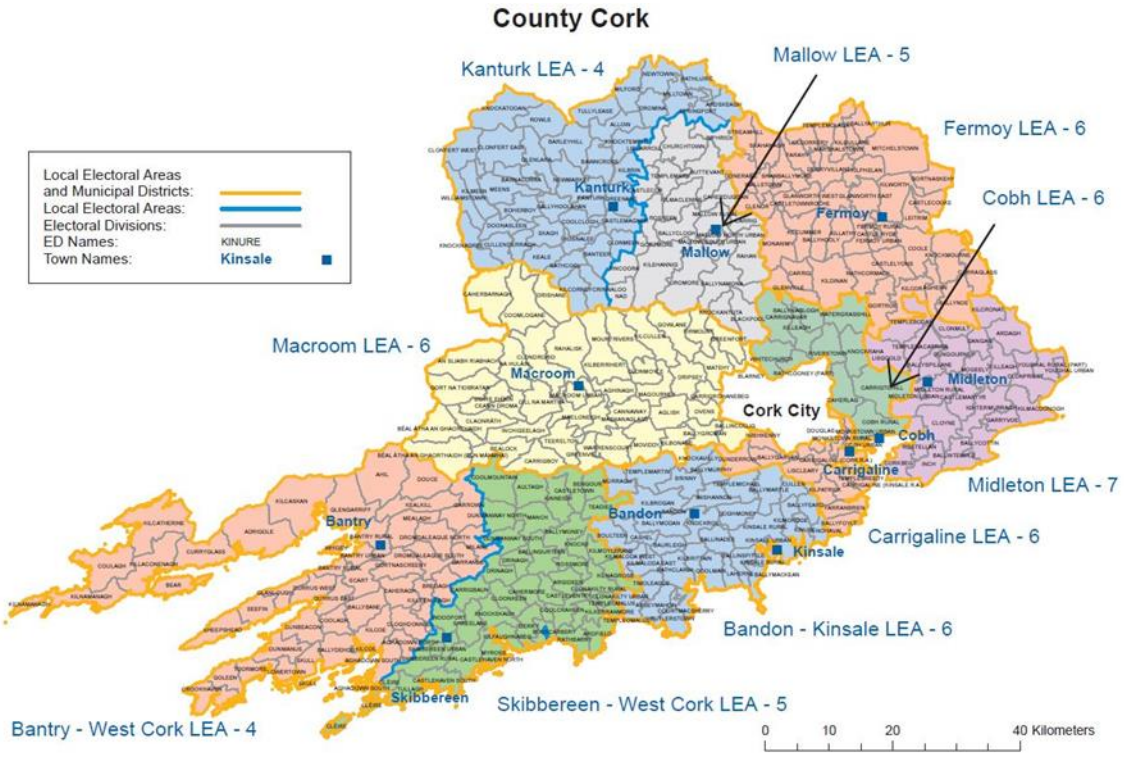

Figure 7.1 Map Of Local Electoral Areas/Electoral Divisions

7.2.2. Information Sources

The principal sources of information are as follows:

- Census and employment information published by the Central Statistics Office (CSO). Available at https://data.cso.ie/;
- Cork County Development Plan 2022-2028, Available at: https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028;
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

The Institute of Public Health in Ireland has issued a document "*Health Impact Assessment Guidance*" which details the link between human health and the built environment (**Figure 7.2).** This document also details the negative health impacts associated with unemployment. Unemployment affects both physical and mental health and is an important determinant of health inequalities in adults of working age. Unemployed people have a higher risk of lower levels of psychological wellbeing ranging from symptoms of depression and anxiety to self-harm and suicide. Unemployment can also impact other health determinants, for example housing, and nutrition. Based on this information, employment generated as a result of The Project has been assessed throughout this Chapter.

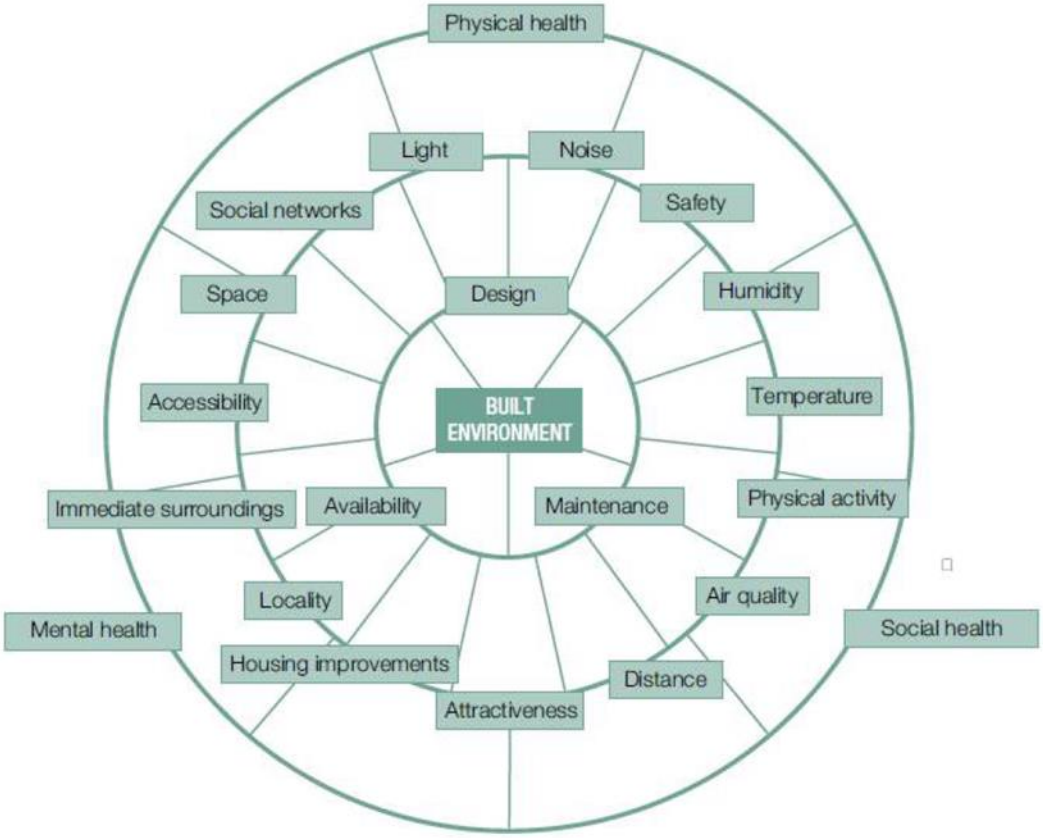

Figure 7.2 Health Impact Of The Built Environment

The European Commission (EC) has published the "*Guidance on The Preparation Of The Environmental Impact Assessment Report*" (EC, 2017). This document defines human health as "*a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air".*

7.3. Receiving Environment

7.3.1. Population and Demographic Analysis

In terms of the County, Region and the State, population structure and change are more strongly influenced by migration and emigration rates than by birth and death rates. The mid to late 1980s in Ireland was a period of heavy population outflow, mainly due to the poor economic and employment situation in the country at that time.

The most recent population estimates (June 2022) published by the CSO indicate that the combination of a net inward migration and high birth rates has resulted in the population of Ireland exceeding 5 million for the first time since 1851. Population projections for Ireland up to 2046 anticipate a population of approximately five million under the most pessimistic scenario and over 6.7 million under the most optimistic scenario. Population

projections for Northern Ireland up to 2034 anticipate a population of approximately two million.

As 2022 population data for towns is not available, the most recent population data for Mallow is from the 2016 census which recorded the town's population at 12,459.

Table 7.1 Population Change in Mallow From 2006 To 2011 To 2016 Census

Area	2006 Census Data	2011 Census Data	2016 Census Data	Proposed 2028 Population
Mallow	10,241	11,605	12,459	15,351

According to the Preliminary 2022 Census results, County Cork has experienced a growth of 7.07% in population from 542,868 in 2016 to 581,231 in 2022.

Table 7.2 Population Change in County Cork From 2016 To 2022 Census

Area	Population 2016 Census Data	Preliminary 2022 Census Data	Change in Number of Persons	Percentage change in Population
Cork	542,868	581,231	**+** 38,363	**+** 7.07

As demonstrated above the population of County Cork has increased steadily since 2011 as per Census results 2011, 2016 and preliminary County data from Census 2022. Although there is no information from the 2022 Census for Mallow it is expected that the town will experience a similar growth in population as County Cork for 2022. The Cork County Development Plan 2022-2028 has estimated the population of Mallow to increase to 15,351 by 2028 and an additional 1,105 housing units will be required for the period 2022-2028 to facilitate this growth (**Table 7.3**).

The Cork County Development Plan states:

"*The provision of water and wastewater infrastructure is fundamental to ensure the delivery of target growth in Mallow in the short-medium term. Water quality impacts and/or licence compliance issues associated with wastewater infrastructure serving the town must be addressed to accommodate further growth*".

The town also has a high number of people in the labour force with a wide variety of industrial groups. Mallow is located within a commutable distance to Cork City (34-minute drive over approximately 30km), which is a major centre of employment (See **Section 7.3.3** of this Chapter for more detail).

As described in **Section 1.2.2**, the Mallow Sewerage Scheme Upgrade Project will increase the treatment capacity of the Mallow WwTP which will facilitate the estimated population growth and ensure that future development in the area is not constrained due to wastewater treatment capacity.

Table 7.3 Population, Households and Net New Houses For Mallow (Cork County Development Plan 2022-2028)

Table 3.2.3: Mallow Population and Housing Supply						
	Housing Requirement			Housing Supply		
Name	Population Census 2016	Population Target (to 2028)	New Units Required (to 2028)	Housing Supply from Residential and Mixed-Use Zoning including Compact Growth Sites	Housing Supply from Residential Additional Provision Sites	Housing Supply from Residential Reserve Sites
Mallow	12,459	15,351	1,105	1,105	102	1,785

7.3.2. Population and Age

CSO data records that there were 12,459 people living in Mallow in 2016 and 417,211 in County Cork. **Table 7.4** shows the breakdown of the population in Mallow compared with County Cork and the State.

Overall, the population of Mallow reflects the general population trends in both the wider area of County Cork and the State. **Table 7.4** shows that people aged 5-24 make up the majority of the population in Mallow (26.27%) and this is in line with the values for County Cork (26.59%) and the State (26.28%). The next largest group covers those aged 35-44 years (18.13%) followed by people aged 25-34 (13.40%) and people aged 45-54 (11.49%). People aged 55 years and older make up 22.07% of the population of Mallow.

Table 7.4 Population Categories By Age For Mallow, County Cork And The State

Age Range	Mallow		County Cork		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
0-4 years	1076	8.64	31,337	7.51	331,515	6.96
5-24 years	3273	26.27	110,957	26.59	1,251,489	26.28
25-34 years	1669	13.40	50,259	12.05	659,410	13.85
35-44 years	2259	18.13	68,029	16.31	746,881	15.68
45-54 years	1432	11.49	57,769	13.85	626,045	13.15
55-64 years	1166	9.36	44,744	10.72	508,958	10.69
65-74 years	877	7.04	32,186	7.71	373,508	7.84
75 years and over	707	5.67	21,930	5.26	264,059	5.55
Total	**12,459**		**417,211**		**417,211**	

7.3.3. Economic Activity and Employment

The labour force is defined as the number of people above the legal working age that are available to work. The labour force participation rate is the number of people who are employed and unemployed but looking for a job, divided by the total working-age population.

In 2016, there were 2,304,037 persons in the labour force in Ireland. This represented an increase of 71,834 (3.2%) on 2011 statistics. The substantial increase in retired persons (up 19.2% to 545,407) has impacted on the labour force participation rate, which fell to 61.4%.

Table 7.5 shows the percentage of the total population aged 15+ who were in the labour force during the 2016 Census. This figure is further broken down into the percentages that were at work or unemployed. It also shows the percentage of the total population aged 15+ who were not in the labour force*, i.e.,* those who were students, retired, unable to work or performing home duties.

When assessing the percentage of people in the labour force it is noted that 60.35% of the population of Mallow are in the workforce which is similar to the values seen in County Cork (61.62%) and the State (61.35%).

The number of people classed as an *Employer or own account worker* in Mallow (5.24%) is lower than the average for County Cork (10.19%) and the State (8.35%). The number of people classed as an *Employee* in Mallow (45.33%), which is close to the average for County Cork (45.58%), and higher than the State (44.96%). The number of people classed as *Assisting a relative* and *Unemployed looking for first regular job* in Mallow is also similar to the averages for County Cork and the State (**Table 7.5**).

The number of people classed as *Unemployed having lost or given up previous job* (8.37%) is higher than the average for County Cork (5.12%) and the State average (7.08%).

The number of *Students or pupils* in Mallow (10.31%) is slightly lower than the average for County Cork (11.17%) and the State (11.37). The number of *Retired* people in Mallow (14.77%) is in line with the average for County Cork (14.18%) and the State (14.52%). The number of people *Looking after home/family* or *Unable to work due to permanent sickness or disability* in Mallow is similar to the averages for County Cork and the State and does not deviate by more than 1.5%.

Table 7.5 Economic Status of The Population Aged 15+ In 2016 (Source: CSO)

Status		Mallow	% of People	County Cork	% of People	State	% of People
% of population aged 15+ who are in the labour force		**No. of People**	**% of People**	**No. of People**	**% of People**	**No. of People**	**% of People**
% of which are	Employer or own account worker	492	5.24	32759	10.19	313,404	8.35
	Employee	4260	45.33	146591	45.58	1,688,549	44.96
	Assisting relative	16	0.17	540	0.17	4,688	0.12
	Unemployed looking for first regular job	117	1.24	1827	0.57	31,434	0.84
	Unemployed having lost or given up previous job	787	8.37	16460	5.12	265,962	7.08
Total population aged 15+ who are in the labour force		**5,672**	**60.35**	**198,177.0**	**61.62**	**2,304,037**	**61.35**
% of population aged 15+ who are not in the labour force		**No. of People**	**% of People**	**No. of People**	**% of People**	**No. of People**	**% of People**
% of which are	Student or pupil	969	10.31	35933	11.17	427,128	11.37
	Looking after home/family	807	8.59	27965	8.70	305,556	8.14
	Retired	1388	14.77	45612	14.18	545,407	14.52
	Unable to work due to permanent sickness or disability	518	5.51	12926	4.02	158,348	4.22
	Other economic status	44	0.47	1007	0.31	14,837	0.40

Total population aged 15+ who are not in the labour force	**3,726**	**39.65**	**123,443.0**	**38.38**	**1,451,276**	**38.65**

Table 7.6 shows the highest level of education reached in Mallow. The majority of people have reached an *Upper secondary* (14.86%), *Lower secondary* (13.93%) or *Economic status - total at school, university, etc*. (10.31%) level of education.

Table 7.6 Highest Level of Education Reached In Mallow

Highest Level of Education Completed	No. of People	% of People
Upper secondary	1397	14.86
Lower secondary	1309	13.93
Economic status - total at school, university, *etc.*	969	10.31
Technical/vocational	832	8.85
Economic status - other	751	7.99
Honours bachelor degree/professional qualification or both	708	7.53
Primary	697	7.42
Ordinary bachelor degree/professional qualification or both	584	6.21
Postgraduate diploma or degree	572	6.09
Not stated	530	5.64
Advanced certificate/completed apprenticeship	513	5.46
Higher certificate	368	3.92
No formal education	137	1.46
Doctorate (Ph.D.)	31	0.33
Total education ceased and not ceased	**9398**	

Table 7.7 details the Broad Industrial Groups that make up the Labour Force of Mallow. Of the 3,352 people in the workforce 18.56% of people are employed in *Manufacturing*, 14.53% are employed in W*holesale and retail trade; repair of motor vehicles and motorcycles* and 12.53% are *Unemployed, having lost or given up previous job*. The remaining categories each make up between 0% and 8.4% of the population of Mallow (**Table 7.7**).

Table 7.7 Broad Industrial Group in Mallow

Broad Industrial Group	No. of People	% of People
Unemployed, having lost or given up previous job	787	13.88
Wholesale and retail trade; repair of motor vehicles and motorcycles	740	13.05
Human health and social work activities	582	10.26
Manufacturing	556	9.80
Education	395	6.96
Industry not stated	358	6.31
Accommodation and food service activities	317	5.59
Public administration and defence; compulsory social security	297	5.24
Construction	285	5.02
Professional, scientific and technical activities	234	4.13
Transportation and storage	201	3.54
Information and communication	155	2.73
Other service activities	150	2.64
Administrative and support service activities	139	2.45
Unemployed looking for first regular job	117	2.06
Financial and insurance activities	102	1.80
Arts, entertainment and recreation	66	1.16
Agriculture, forestry and fishing	65	1.15
Water supply; sewerage, waste management and remediation activities	63	1.11
Electricity, gas, steam and air conditioning supply	32	0.56
Real estate activities	20	0.35
Activities of households as employers producing activities of households for own use	7	0.12
Mining and quarrying	4	0.07
Activities of extraterritorial organisations and bodies	0	0.00
Total in labour force	**5672**	

The closest social welfare office to Mallow WwTP which has figures available for the number of people on the Live Register / unemployed is the Mallow Intreo Centre. The monthly unemployment release contains a series of monthly unemployment rates and volumes. These series are based primarily on the Labour Force Survey and are compiled in accordance with agreed international practice. These statistics are the definitive measure of monthly unemployment. The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit or Jobseekers Allowance or for various other statutory entitlements at local offices of the Department of Social Protection. **Table 7.8** details the most recent information available from the CSO from April 2022 to September 2022 on the number of persons on the Live Register. The number of people on the Live Register has remained consistent in the last 6 months with a 5% reduction from April 2022 to September 2022.

Table 7.8 Number of People On The Live Register In Mallow

Month	April 2022	May 2022	June 2022	July 2022	August 2022	September 2022
Number of Persons on Live Register	1058	1027	1147	1197	1209	1004

7.3.4. Tourism and Amenities

Mallow is a town in north County Cork located in the Blackwater River valley and boasts a wide range of activities for tourists and locals. The area is well known for its horseracing and Cork Racecourse Mallow located on the bank of the Blackwater River is approximately 2km from the town of Mallow and hosts over 20 horse racing meetings a year. The Blackwater catchment also provides excellent fishing opportunities and is a well known and attractive spot for the angling community. The Donkey Sanctuary is a charity that is located 22km outside of Mallow town in Liscarroll which rescues and rehomes donkeys from all over Ireland. Visitors can attend the open farm and see over 150 donkeys and mules whilst making donations to support the charity. The Blackwater Valley Cycling Route spans 191km, boasts numerous sites of cultural and heritage importance and passes through Mallow. Ballyhass Lake is located a 13-minute drive outside of Mallow Town where Ballyhass Adventure Group offers a range of outdoor activities both on and off the lake. These include kayaking, an adult swim course, an inflatable "*Aquapark*", archery and axe throwing.

Mallow is located approximately 30km north of Cork city and is a 34-minute drive away. The town is located approximately 30km west of the M8 motorway which connects Cork to Dublin. Cork is Ireland's second largest city and has a rich historical and archaeological heritage. Cork City Gaol is a former 19th century prison, now a museum, located in Cork City which offers guided and self-guided tours year-round. The English Market is an indoor food market located in the city centre which has been officially trading since 1788. The market offers a mix of quality meats and fish, herbs, spices, fruit, vegetables, baked delicacies and speciality cheeses. Fota Wildlife Park is a 100-acre wildlife park located on Fota Island, near Carrigtwohill, County Cork, Ireland and has an annual attendance of approximately 460,000 visitors. It is currently the second largest visitor attraction in Ireland outside of Leinster.

7.3.5. Travel and Commuting

Table 7.9, **Table 7.10** and **Table 7.11** show commuter information from Mallow including time of commute, duration of commute and means of transport. The total number and percentage of people is detailed in the following tables along with a further breakdown of the age groups; Population aged 15 years and over at work, Children at school aged between 5 and 12 years, Students at school or college aged between 13 and 18 years and Students at school or college aged 19 years and over.

Most people in Mallow leave home for work, school or college between 08:31 and 09:00 (26.42%). The second most popular time to leave home is between 08:01 and 08:30 with 22.96% of people leaving at this time followed by 11.98% of people between 07:31 and 08:00. A further 23.36% of people leave before 07:31 and 10.37% of people leave home after 09:01.

Table 7.9 Time Leaving Home in Mallow

	All persons	Percentage	Population aged 15 years and over at work	Children at school aged between 5 and 12 years	Students at school or college aged between 13 and 18 years	Students at school or college aged 19 years and over
Before 06:30	460	6.04	449	4	1	6
06:30 - 07:00	561	7.36	532	5	2	22
07:01 - 07:30	759	9.96	658	23	18	60
07:31 - 08:00	913	11.98	740	50	64	59
08:01 - 08:30	1749	22.96	754	488	427	80
08:31 - 09:00	2013	26.42	619	961	310	123
09:01 - 09:30	266	3.49	197	21	9	39
After 09:30	524	6.88	500	2	0	22
Not stated	373	4.90	206	108	38	21
All departure times	**7618**		**4655**	**1662**	**869**	**432**

A total of 40.44% of people commute for less than 15 minutes to work, school or college followed by 20.77% of people commuting between 15 and 30 minutes and 14.60% of people commuting between 30 and 45 minutes. Altogether this results in 75.81% commuting for less than 45 minutes. A total of 17.15% of people commute for longer than 45 minutes (**Table 7.10**).

Table 7.10 Duration of Travel Times in Mallow

	All persons	Percentage	Population aged 15 years and over at work	Children at school aged between 5 and 12 years	Students at school or college aged between 13 and 18 years	Students at school or college aged 19 years and over
< ¼ hour	3081	40.44	1464	969	540	108
¼ hour - < ½ hour	1582	20.77	860	445	198	79
½ hour - < ¾ hour	1112	14.60	905	84	48	75
¾ hour - < 1 hour	648	8.51	563	16	12	57
1 hour - < 1½ hours	555	7.29	478	5	11	61
1½ hours and over	103	1.35	80	1	1	21
Not stated	537	7.05	305	142	59	31
Total time travelling	**7618**		**4655**	**1662**	**869**	**432**

The majority of people in Mallow commute to work, school or college by *Motor car: Driver* (42.82%) followed by 24.26% of people commuting as *Motor car: Passenger.* This totals to 67.08% travelling by car either as a driver or passenger. In terms of public transport 2.54% of people travel by bus and 2.70% travel by Train, DART or LUAS (**Table 7.10**).

Table 7.11 Means of Travel in Mallow

	All persons	Percent	Population aged 15 years and over at work	Children at school aged between 5 and 12 years	Students at school or college aged between 13 and 18 years	Students at school or college aged 19 years and over
Motor car: Driver	3309	42.82	3168	0	18	123
Motor car: Passenger	1875	24.26	251	1083	481	60
On foot	1288	16.67	534	337	301	116
Not stated	347	4.49	178	117	35	17
Van	313	4.05	312	1	0	0
Train, DART or LUAS	209	2.70	106	0	17	86
Bus, minibus or coach	196	2.54	38	122	14	22
Work mainly at or from home	110	1.42	105	2	1	2
Bicycle	48	0.62	37	2	3	6
Other, incl. lorry	22	0.28	22	0	0	0
Motorcycle or scooter	11	0.14	9	0	0	2
Total	**7728**		**4760**	**1664**	**870**	**434**

7.3.6. Landscape and Visual

Mallow is located on the intersection of the N20 Cork to Limerick route, the N72 Cork to Killarney route and the N73 Mallow to Mitchelstown route. The Mallow agglomeration covers Mallow town which consists of predominantly residential and commercial land use with some agricultural fields on the outskirts of the agglomeration boundary.

7.3.7. Human Health

The Healthy Ireland Framework 2013-2025 defines health as '*everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play'*. This framework also states that health is much more than an absence of disease or disability,

and that individual health, and the health of a country affects the quality of everyone's lived experience.

Health is an essential resource for everyday life, a public good and an asset for human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework 2013-2025 is a collective response to the challenges facing Ireland's future health and wellbeing. **Table 7.12** shows that 86.67% of people have declared themselves as having Very Good or Good health which is slightly lower than the same categories in County Cork (89.5%).

Table 7.12 Health Status in Mallow And County Cork

Health Status	Mallow No. of People	Percent	County No. of People	Percent
General health - Very good	7076	56.79	263057	63.05
General health - Good	3723	29.88	110351	26.45
General health - Fair	1037	8.32	28786	6.90
General health - Bad	178	1.43	4276	1.02
General health - Very Bad	37	0.30	967	0.23
Not stated	408	3.27	9774	2.34
Total	**12459**		**417211**	

7.3.8. Social Health

According to the World Health Organisation (WHO), poor social and economic circumstances affect health throughout life. Good health involves reducing levels of educational failure, reducing insecurity and unemployment, and improving housing standards. Health is influenced, either positively or negatively, by a variety of factors. Some of these factors are genetic or biological and are relatively fixed. '*Social determinants of health*' arise from the social and economic conditions in which people live. They are not so fixed such as type of housing and environments, access to health or education services, incomes generated and the type of work people do, can all influence a person's health, and the lifestyle decisions people make.

A range of factors have been identified as social determinants of health. These can include the wider socio-economic context, inequality, poverty, social exclusion, socioeconomic position, income, public policies, health services, employment, education, housing, transport, the built environment, health behaviours or lifestyles, social and community support networks and stress.

People who are less well off or who belong to socially excluded groups tend to fare badly in relation to these social determinants. Being at work on the other hand provides not only an income, but also access to social networks, a sense of identity and opportunities for development or progression.

Figure 7.3 presents the social determinants of health adapted from Dalghren and Whitehead (1991) and Grant and Barton (2006) as presented in Healthy Ireland.

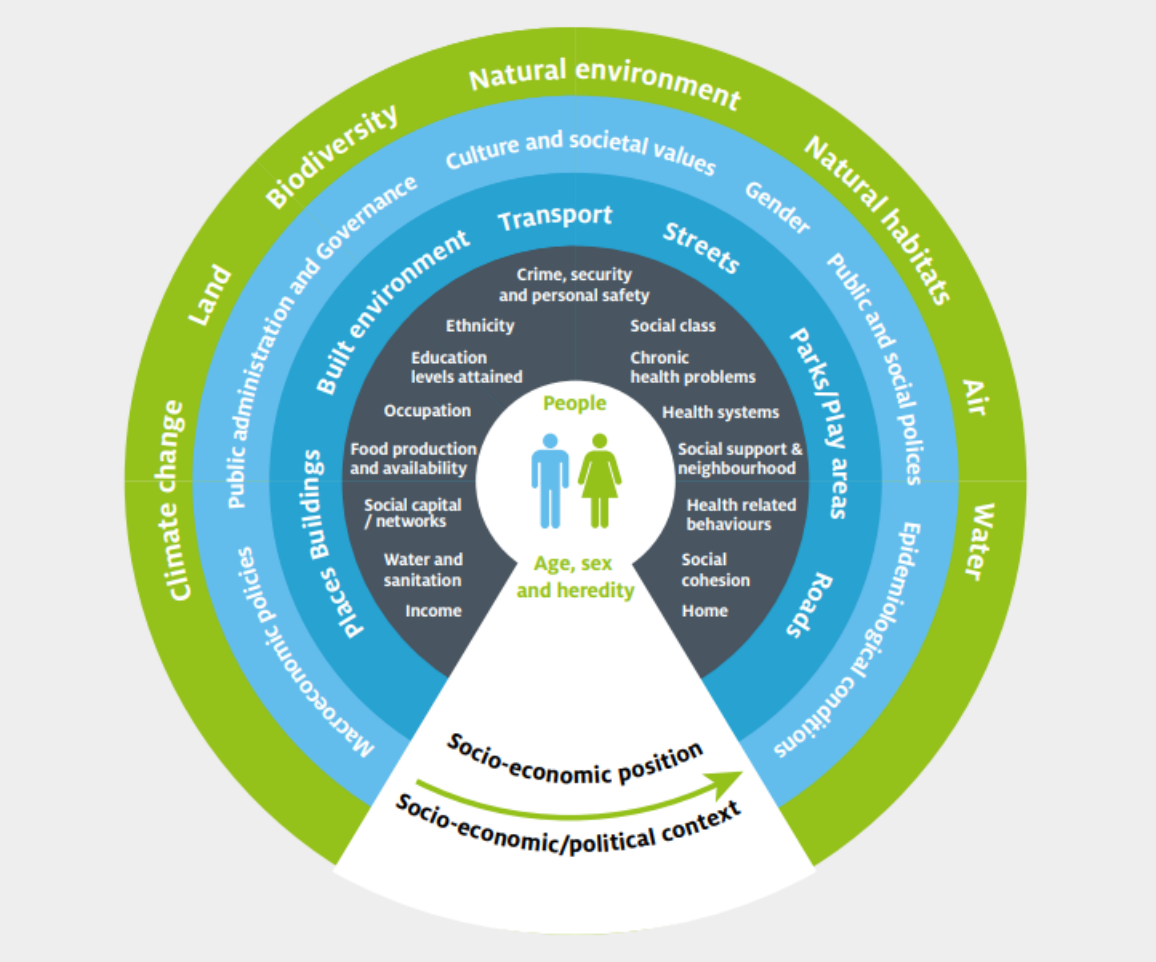

Figure 7.3 Social Determinants Of Health (Healthy Ireland, DOH 2013)

Section 7.3.3 of this Chapter states that 60.35% of people in Mallow are in the labour force. This reflects the high number of people of a working profile living within the area as identified in **Table 7.5.**

As per the current situation, it is proposed that approximately 1-2 people will be employed at the Mallow WwTP and new Bridge Street Pumping Station. The impact of this is detailed in **Section 7.4** of this Chapter.

As detailed in **Table 7.12**, the majority of people in Mallow have self-identified themselves in the 2016 Census as having *'very good health'* or *'good health'*. The high employment levels, coupled with the self-identification of health status indicate that positive social health conditions exist.

7.3.9. Water Quality and Water-related Diseases

Water-related diseases, as defined by the Protocol on Water and Health, are *"any significant adverse effects on human health, such as death, disability, illness or disorders, caused directly or indirectly by the condition, or changes in the quantity or quality, of any waters*". Consumption of contaminated water through drinking water, wastewater or recreational water can cause serious human health effects.

The WHO has reviewed water-related infectious diseases in the pan-European region, which comprises 53 countries including Ireland. Diseases with the highest number of reported outbreaks are viral gastroenteritis, hepatitis A, *E. coli* diarrhoea and legionellosis. In the WHO European Region, waterborne diseases constitute a significant health burden, with approximately 18% of reported infectious disease outbreaks associated with the water exposure pathway (WHO, 2016).

Over 95% of Ireland's drinking water can be described as "*safely managed*" with "*Drinking-water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination*". The EPA has published a report titled "*Drinking Water Quality In Public Supplies 2021"* which found that Ireland's drinking water was safe to drink with 99.7% of supplies complying with microbiological and chemical standards for drinking water. While water quality remains high, drinking water treatment in many supplies is still not as resilient as it needs to be to ensure the supply is safe into the future (EPA, 2022). The Project will contribute to strengthening the protection of the drinking water supply as the operational discharges from the Mallow agglomeration will receive secondary treatment with Phosphorus and Nitrogen removal to comply with the proposed ELVs in **Table 3.2.**

7.3.10. Conclusion

- There is a high working age profile in Mallow which is reflected in the percentage of people in the labour force (60.35%).
- People who are *Unemployed, having lost or given up previous job* make up the largest broad industrial group in the labour force at 13.88% (**Table 7.7)** the number of people who are unemployed in Mallow is in line with the State average.
- The majority of people (40.44%) spend less than 15 minutes commuting to work, school or college in Mallow indicating that most people work or study in the surrounding area.
- There is a large reliance on cars as a means of travel with 67.08% of people travelling by car either as a driver or passenger. A total of 2.54% of people utilise public transport in the form of bus or rail.
- The majority of people have declared themselves as being in very good or good health (86.69%) in Mallow.

7.4. Description of Likely Significant Effects

Human Health and Safety

The existing sewer network in Mallow contains a number of SWOs which frequently discharge untreated wastewater to the River. Untreated wastewater contains bacteria and viruses that can cause infection and disease. If wastewater enters the drinking supply or contaminates surface water this can have a negative effect on the human health of the surrounding population. The Mallow Sewerage Scheme Upgrade Project will involve the removal of a total of 9 no. SWOs and the provision of a stormwater storage tank (2,400m^3) at the new Bridge Street Pumping Station along with increasing the capacity of the WwTP to 22,000 p.e. In the event that the storm water tank is at capacity an overflow from the storm tank will be discharged to the River Blackwater *via* a new SWO (SW010 – NGR 156636E, 097862N). Overflows to the storm water storage tank will be screened *via* a

self-cleaning mechanical screen. The risks of sewer or outfall failure associated with extreme events resulting in the activation of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent Emergency Overflows that can be applied has been incorporated in the design and operation of the agglomeration.

The above measures will reduce the risk of unintentional discharges to the River Blackwater. The operational capacity at Mallow WwTP will also be increased from 10,500 p.e. to 22,000 p.e.

It is expected that all workers employed during the operational phase of The Project will comply with the relevant Health Service Executive (HSE) guidelines and any Government protocols that will be in place at that point in time in relation to COVID-19. If all COVID-19 safety protocols and hygiene measures are adhered to it is considered that The Project poses no additional COVID-19 risk.

Based on the above information, there will be a slight, positive, long-term impact on human health. When compared with the existing baseline conditions the impact of operational discharges on human health will be slightly positive. This is based on the fact that upon completion, the operational discharges will ensure compliance with the Urban Waste Water Treatment Directive (UWWTD), Irish Water's design criterion for a 1:20 year return period storm event, the Water Framework Directive (WFD) and will ensure compliance with the WWDL - Licence Register Number: D0052-01, issued by the EPA in accordance with the Waste Water Discharge (Authorisation) Regulations (S.I. No. 684 of 2007) (now S.I. No. 214 of 2020) on the 18th of December 2012, which is an improvement on the baseline conditions. All flows arriving at the upgraded WwTP will receive secondary treatment with Phosphorus and Nitrogen removal to comply with the proposed ELVs in **Table 3.2**. Potential human health risks from the discharge of untreated wastewater from overflows will be reduced as a result of The Project. The increase in treatment capacity to the Mallow WwTP will contribute to protecting the local environment and public health.

Water Quality & Population

The more stringent ELVs for the primary discharge will support the appropriate water chemistry conditions and will therefore not hinder the achievement of the FWPM Regulation standards (High Status) and will not hinder the targets of the WFD (Good Status). The removal of 9 no. SWOs as part of the Mallow Sewerage Scheme Upgrade Project and the provision of appropriate treatment of Ammonia, along with the proposed ELV for Ortho-phosphate, and the proposed design and operation of the Dual Function Overflow, SW010, will result in a reduction in overall nutrient input into the river system. This will have a slight positive effect on water quality in the surrounding environment, as determined in **Chapter 6**. The Project will ensure compliance with the UWWT Directive. The improvement in water quality reduces the potential for impacts from water-borne diseases and health risks (as described above).

Thus, a slight, positive, long-term impact is expected on the population of Mallow as a result of the improved water quality.

Socio-economic

The Mallow WwTP and Bridge Street Pumping Station run automatically and are capable of being monitored on a daily basis *via* the SCADA system. As per the current situation, the proposed upgraded WwTP will be a manned site during normal working hours on Monday – Friday with 24 hours call out response where the amount of time spent on site will vary depending on various factors *e.g.,* weather or breakdowns in plant or maintenance works required such as cleaning of the intake screens *etc.* As per the current situation, it is proposed that approximately 1-2 people will be employed during the operational phase having an imperceptible impact to the local economy and employment.

Air Quality – Odour

Odour has the potential to negatively impact the general amenity at surrounding sensitive receptors such as residential homes, hospitals, nursing homes, creches, businesses (retail/commercial), industry and schools. Potential odour effects have been assessed in **Chapter 12** of this EIAR and concluded that there will be no significant odour impact as a result of the operational discharges and as such there will be no significant impact on population and human health.

Noise and Vibration

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home. Noise has been assessed in **Chapter 11** and this Chapter concluded that the operational discharges will not have a significant impact in relation to Noise and vibration. As such there will be no significant impact on human health as a result of noise.

7.5. Mitigation Measures

All workers employed with the Project will comply in full with the relevant HSE guidelines and any Government protocols that may be in place at that point in time in relation to COVID-19.

No specific mitigation measures are required in relation to population and settlements, given the lack of direct effects resulting from the Mallow agglomeration operational discharges.

7.6. Residual Impacts

No negative residual impacts in the context of Population and Human Health are anticipated regarding the operational discharges from the Mallow agglomeration. The increased treatment capacity as a result of the Mallow Sewerage Scheme Upgrade Project will result in slight, positive, long term residual impact on the population and human health of the surrounding environment. The increased capacity will also allow for future development to take place in the town of Mallow and depending on the nature of the development this could have a positive effect on population and human health in the form of socio-economic improvements, community amenities or residential developments to supply housing.

7.6.1. Cumulative Impacts

There are no cumulative impacts with other plans and projects predicted.

7.7. Monitoring

Section 3.5.3 of this EIAR has detailed general "*Measures to Prevent Unintended Discharge*". The general measures below will be implemented which will subsequently act as monitoring measures to prevent significant effects on Population and Human Health.

- All flows will be monitored continuously and recorded at the electromagnetic flowmeters.
- Ensure the primary discharge is compliant with licensed ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis in line with WWDL requirements

No specific monitoring measures are required in relation to Population and Human Health, given the lack of direct effects resulting from the operational discharges.

8. MATERIAL ASSETS

8.1. Introduction

Material Assets have been defined as '*Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons'* (EPA 2002).

This definition is further expanded by the EPA in 2022 in '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' which states;

'*In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils*.'

The scope and definition of Material Assets within the context of the EIA process has been defined by the EIA Directive as including Archaeology, Architectural and Cultural Heritage. These elements are assessed separately in **Chapter 13** under Archaeology, Architectural and Cultural Heritage.

This Chapter of the EIAR, prepared by Enviroguide Consulting, provides an assessment of the potential impacts of the operational discharges on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity Supply;
- Gas Supply;
- Information and Communications Technology;
- Surface Water Drainage Infrastructure;
- Water Supply and Demand;
- Wastewater Management; and
- Waste Management.

Natural resources (water, land, biodiversity, air, *etc.*) are addressed in their respective Chapters.

Traffic and Transport are addressed in **Chapter 9**.

In line with the EPA "*Guidelines on the information to be contained in Environmental Impact Assessment Reports*" (EPA, 2022), the terms are defined in **Section 2.5** when quantifying the quality of effects. See also **Table 2.** in **Chapter 2.**

8.1.1. Statement of Authority

This Chapter was prepared by Enviroguide Principal Environmental Consultant Charlotte Lawler-Greene. Charlotte has a B.Sc. in Botany (Hons) from NUI Galway, an M.Sc. in Environmental Sciences from University of East Anglia and a Diploma in Health, Safety and Environmental Management from IT Carlow. Charlotte has 17 years professional experience as an Environmental Consultant and Compliance Specialist.

8.2. Methodology

The methodology adopted for the assessment takes cognisance of the following relevant guidelines :

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR);
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements; and
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

The scope of work undertaken for the assessment included a desk-based study of material assets. Built services and infrastructure associated with the existing development and The Project were considered in the assessment of potential impacts on material assets.

Information on built assets in the vicinity of the Mallow agglomeration was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans, EIR E-Maps; and
- Planning documents including EIA Screening, NIS, and Engineering Reports.

Assessment of the likely impact of features of The Project, including surface water runoff, foul water discharge and water usage was carried out in accordance with the following guidelines:

- IS EN752, "*Drain and Sewer Systems Outside Buildings*"

8.2.1. Prediction and Assessment of Impacts

In line with the EPA "*Guidelines on the information to be contained in Environmental Impact Assessment Reports*" (EPA, 2022), the terms are defined when quantifying the quality of effects. Impacts will vary from negative to neutral or positive and will vary in significance on the receiving environment. The significant of effects has been determined based on the severity of potential disturbance to existing material assets. Where significant potential impacts were identified, mitigation measures are proposed to minimise impacts.

8.3. Receiving Environment

8.3.1. Land-use and Local Settlement

The Mallow agglomeration is in Mallow North Urban and Mallow South Urban Electoral Division (ED) which are both in the Mallow Local Electoral Area (LEA) (**Figure 8.1**) For the purpose of this Chapter the town of Mallow has been selected as the study area. Mallow is a town in County Cork which is located approximately 30km north of Cork City.

Mallow is located on the intersection of the N20 Cork to Limerick route, the N72 Cork to Killarney route and the N73 Mallow to Mitchelstown route. Mallow is located approximately 30km north of Cork city. The town is located approximately 30km west of the M8 motorway which connects Cork to Dublin. The town is the administrative centre of North Cork County.

The Mallow agglomeration covers Mallow town which consists of predominantly residential and commercial land use with some agricultural fields on the outskirts of the red line boundary (refer to **Figure 1.1** in **Chapter 1**).

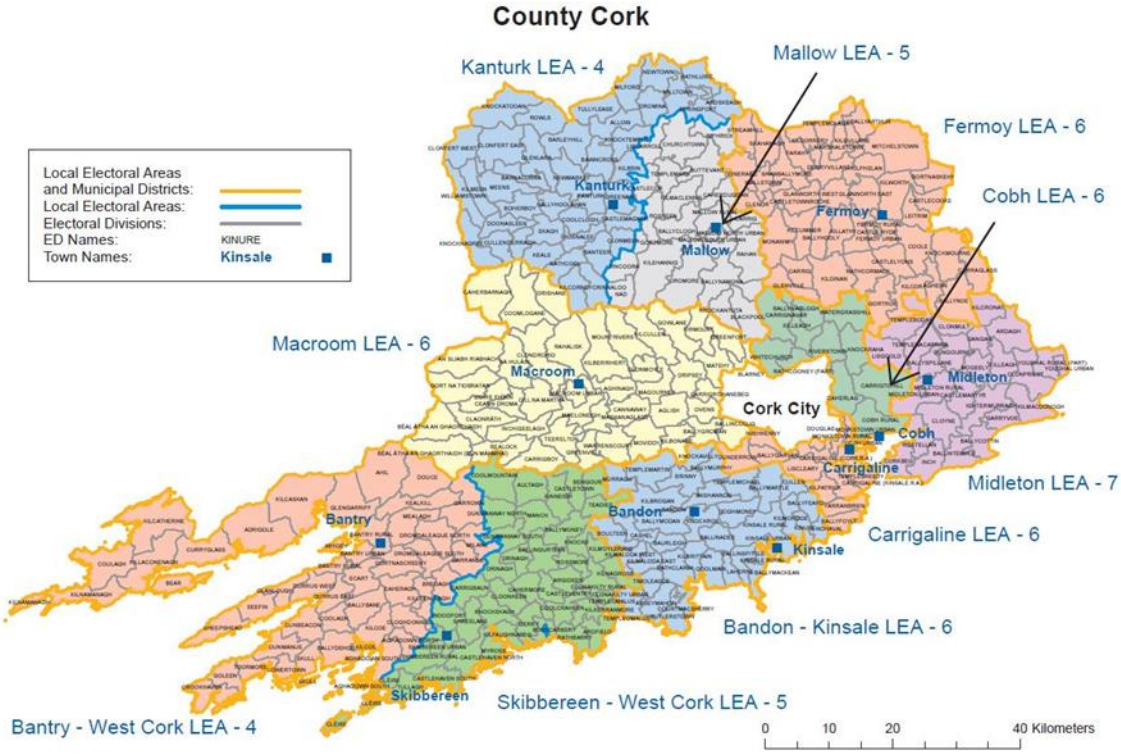

Figure 8.1 Map of Local Electoral Areas/Electoral Divisions

8.3.2. Land-use History

Mallow lies on the River Blackwater and was developed as a defensive settlement protecting an important fort over the river.

The Town has a population of 12,469 as of the 2016 census (CSO, 2016). The town is serviced by Bus and Rail networks and the nearest airport is Cork Airport (42.5km). The town developed in the late 16th Century as a Plantation town and was a prosperous market town for North Cork County due to its rich agricultural surroundings.

The town transitioned into an industrial hub in the early 20th century with agricultural produce from the area providing raw materials for a range of Agri-food related industries (sugar, Confectionaries and Creameries). The Sugar Factory operated for over 75 years in the town until its closure in 2006. Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2020) were reviewed and key observations of the study area are summarised in **Table 8.1** below.

Table 8.1 Historical Land Use

Date	Information Source	Site Description
1837-1872	**OSI map 6 Inch** **First Edition Black & White**	Mallow Town was a well-established Market town with numerous businesses operating in the town including, Post Office, an Army Barracks, Diocesan School, Parochial School, a National School, a Brewery, a Court house, Markets, R.C Chapel and Church, a Tannery, Salt works, a Canal, and the County Infirmary. The River Blackwater is located *ca.* 250m south of the Main Street. The land south of the town is undeveloped grassland and the Castle lands. To the southwest of the town and south of the river lies Mallow Flour Mills and Mill Race. Mainly farmland is located south of the River Blackwater with sandpits and quarries scattered
1829-1842	**OSI map 6 Inch Colour**	No significant changes.
1830-1930	**OSI Cassini 6inch**	Town limits extended and more infrastructure mapped including the Railway line and Station to the west, the Ballyclough Creamery, and a Steam mill. The Mallow Corn/Flour Mills are now listed as disused. The Town Park land north of the River Blackwater is listed as '*Liable to Flood*' and a disused pumping station is mapped.
1888-1913	**OSI map 25inch**	Further development south of Mallow Bridge and along Mill Street and Berry's Lane, the majority of the land north and south of the River Blackwater continues to be listed as '*liable to flood*' and comprises parkland and meadows.
1995	**Aerial photography**	Land south of the River Blackwater (Bellevue area) is fully developed with residential and commercial development. The land north of the river continues to be parkland. The water treatment plant is located west of Mallow town Park. Residential development has started in the Quartertown area (the location of the Corn mills). The N20 traverses the River Blackwater to the east of the Railway line. Mallow WwTP and the Bridge Street Pumping Station are developed and located on the southern side of the Blackwater River in Ballyellis.
1999 - 2003	**Aerial photography**	Quartertown is redeveloped as residential land with an industrial area developing in Lower

Date	Information Source	Site Description
		Quartertown. Land to the east of Bridge Street in the Ballyellis area is largely undeveloped.
2004-2006	**OSI Aerial photography**	No significant changes. Further residential development and town expansion on the outer fringes of the town both north and south of the river.
2005-2011	**OSI Aerial photography**	No significant changes. Further infill development and peripheral expansion of the town limits
2011-2013	**Digital Globe**	No significant changes. Further infill development and peripheral expansion of the town limits
2013-2018	**MapGenie Imagery**	No significant changes. Further infill development and peripheral expansion of the town limits
2022	**Google Maps Photography** *Imagery©2022 Google, Imagery©2022 CNES/Airbus, Maxar Technologies, Map Data ©2022*	No significant changes. Further infill development and peripheral expansion of the town limits

8.3.3. Electricity Supply

Electricity to the town is mainly supplied by overhead lines and underground infrastructure from the Mallow 110kV Station located on St Joseph's Road, Mallow. The existing WwTP is powered by overhead lines. EirGrid is responsible for operating and planning development of the transmission system and operate the transmission grid in County Cork.

No additional electrical inputs or substations are required in order to service the operational discharges.

8.3.4. Gas

Gas Networks Ireland has been developing the gas network since 1978. The distribution and transmission network of gas pipeline consists of over 14,617km and links the UK and European gas markets to Ireland through two Interconnector pipelines with Scotland. Natural gas accounts for 30% of Ireland's primary energy requirements (Gas networks Ireland, 2022).

Mallow town is serviced by piped gas from Interconnector 1 *via* Charleville. There are no gas pipelines in the near vicinity of the operational discharges.

8.3.5. Information and Communications Technology (ICT)

There are overhead Telecommunication cables running along the lands that service the WwTP and Bridge Street Pumping Station. There are no other ICT cables of relevance to the operational discharges.

8.3.6. Water Supply

Water Supply for Mallow Town and its environs is provided by IW (Mallow PWS [0500PUB1313]. The Mallow Public Water Supply serves a population of approx. 9,000 people in the town and environs of Mallow Co Cork. The supply is from a surface water source which undergoes full treatment prior to distribution. The Water Treatment Plant (WTP) is located on the northern side of the River Blackwater to the west of the town park.

8.3.7. Surface Water Drainage

The Mallow Sewer Network Upgrade part of the overall Mallow Sewerage Scheme Upgrade Project which is currently underway is expected to be completed in January 2023 and included in the upgrading of the sewer network and the removal of 9 No. Storm Water Overflows, and the construction of a 2,400m^3 storm water holding tank complete with flushing arrangement, automated penstocks, level probes, event loggers, overflow measurement, odour control and access covers. As this project relates to the potential effects to the environment of the operational discharges of the Mallow WwTP, the aspects of the network and WwTP upgrades are provided in **Chapter 3.**

8.3.8. Foul Water Drainage

As this project relates to the potential effects to the environment of the operational discharges from the Mallow WwTW, the aspects of the WwTP and network upgrades are provided in **Chapter 3.**

8.3.9. Waste Management

This subject matter of this EIAR relates to operational discharges and therefore has no solid waste management requirements.

8.4. Description of Likely Significant Effects

This section assesses the impact of operational discharges (SW001 and SW010) on the material assets of the area.

8.4.1. Operational Discharges

8.4.1.1. Settlement

As the principal infrastructure is already in place within the Study area of Mallow Town, and the new elements (*e.g.,* new Dual Function Overflow SW010 from the new Bridge Steet Pumping Station) have been consented under Ref. Planning Register Number: 195078, once operational, the discharges from the upgrade WwTP and new Bridge Street Pumping Station will have no potential effects on the Land-use Zoning objectives for the area. There will be a *'permanent major positive'* impact on local settlement as a result of

The Project due to the renewed capability of the WwTP to operate at increased capacity and service the needs of the Town and environs whilst minimising potential significant effects on the receiving surface water environment, the River Blackwater. Refer to **Chapter 5 Biodiversity** and **Chapter 6 Water**.

No protected views, rights of way or planned pieces of strategic infrastructure or any important tourist sites will be affected in any way by Mallow agglomeration operational discharges.

Based on the subject matter of this EIAR, it is considered that there will be no significant long-term impacts on the built services and infrastructure as a result of Mallow agglomeration operational discharges.

8.4.1.2. Surface Water Drainage

The upgrades approved in the Mallow Sewerage Scheme Upgrade Project were designed to meet objectives within IW's Water Services Strategic Project to target capital investment that will progressively achieve compliance with the UWWT Directive and the WFD. While all current SWOs in the current agglomeration are to be decommissioned, there will be one new Dual Function Overflow from the new Bridge Street Pumping Station. This overflow will discharge to the River Blackwater which is designated as sensitive under the UWWTD (91/271/EEC Schedule 1 Part 2 S.I. 48 of 2010). During a storm event, water will flow to the stormwater holding tank. If storm conditions continue the capacity of the stormwater tank will be reached and an overflow will occur *via* SW010. Diluted, settled, and screened effluent that is discharged during storm conditions, will enter the river which will itself have increased flows driven by sustained rainfall. In this context, the discharges *via* SW010 to the large River Blackwater channel will be diluted and dispersed effectively.

8.4.1.3. Foul water management

The proposed network works will provide for increased flows and the elimination of the current overflows discharging to the River Blackwater. This along with the upgrade to the WwTP will have a permanent major positive effect on foul water management for Mallow Town and provide additional treatment capacity to support the expansion of the town in the future.

8.4.1.4. Water supply

It is not anticipated the that operational discharges, SW001 and SW010, will have any significant effects on water supply for Mallow Town.

8.4.1.5. Power

It is not anticipated that the operational discharges, SW001 and SW010, will have any significant effects on the power supply for Mallow Town.

8.4.1.6. ICT

There will be no effects on Information and Communications Technology from the operational discharges.

8.4.1.7. Waste Management

It is not anticipated that operational discharges will have any significant effects on solid waste management as there is no construction phase associated with the Project. The subject matter of this EIAR only considers operational discharges.

8.5. Mitigation Measures

There are no specific mitigation measures in relation to Material Assets required.

8.6. Residual Impacts

Compliance with the EPA WWDL requirements and the intrinsic design measures to prevent unintended discharges and compliance with the proposed ELVs will ensure that there will be no significant adverse residual impacts associated with the Project in relation to material assets.

A permanent major residual positive impact on foul water management for Mallow Town and its future growth remains.

8.6.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

8.7. Monitoring

No specific monitoring measures are required in relation to material assets, given the lack of direct effects resulting from the operational discharges.

Section 3.5.3 of this EIAR has detailed general "*Measures to Prevent Unintended Discharge*". The general measures below will be implemented which will subsequently act as monitoring measures to prevent significant effects on Material Assets.

- All flows will be monitored continuously and recorded at the electromagnetic flowmeters.
- Ensure the primary discharge is compliant with licensed ELVs; and
- Continue monitoring the effluent and receiving waters, on a consistent and regular basis in line with WWDL requirements

9. TRAFFIC & TRANSPORT

9.1. Introduction

This Chapter of the EIAR was prepared by Nicholas O'Dwyer Ltd. and is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Traffic and Transportation

Given that the subject matter of this EIAR involves operational discharges only, which in themselves do not generate any traffic, a detailed traffic and transport assessment has been scoped out. As a result, no traffic counts were required to inform this assessment.

This Chapter presents the existing road network and access arrangements at the Mallow WwTP and the Bridge Street Pumping Station.

9.1.1. Statement of Authority

This Traffic and Transport Chapter has been prepared by Graham Young. Graham is a Senior Engineer of the civil and structural consultancy, Nicholas O'Dwyer Ltd. His areas of professional expertise are in pipeline and roads civil works design, including traffic and Transport Impact Assessment and mitigation design. Graham Young has over 23 years of civil consultancy experience. Graham is a Chartered member of Engineers Ireland, with a bachelor's degree in Engineering (Civil, Structural and Environmental), and a postgraduate Diploma in Project Management. Graham has attended the National Roads Authority (NRA) three-day Road Safety Audit course.

9.2. Receiving Environment

Mallow is located on the intersection of the N20 Cork to Limerick route, the N72 Cork to Killarney route and the N73 Mallow to Mitchelstown route. Mallow is located approximately 30km north of Cork city. The town is located approximately 30km west of the M8 motorway which connects Cork to Dublin. The town is the administrative centre of North Cork County.

The Mallow WwTP and Bridge Street Pumping Station run automatically and are capable of being monitored on a daily basis *via* the SCADA system. As per the current situation, the proposed upgraded WwTP will be a manned site during normal working hours on Monday – Friday with 24 hours call out response where the amount of time spent on site will vary depending on various factors *e.g.*, weather or breakdowns in plant or maintenance works required such as cleaning of the intake screens, *etc*. In general, there are 1-2 people on site during normal operation of the plant. There is also a maintenance team on site for roughly one week a month to carry out any repairs or any other scheduled larger maintenance that may be required.

Figure 9.1 illustrates vehicular access to both the WwTP site and the Bridge Street Pumping Station from the L1223.

9.3. Description of Likely Significant Effects

Given that the WwTP and Pumping Station are already in operation prior to the permitted upgrades, there will be no significant change to traffic movements on the existing network or to the existing access arrangements during their operation. The operational discharges in themselves do not generate any traffic movements. Therefore, there are no predicted significant impacts on Traffic and Transport as a result of the operational discharges.

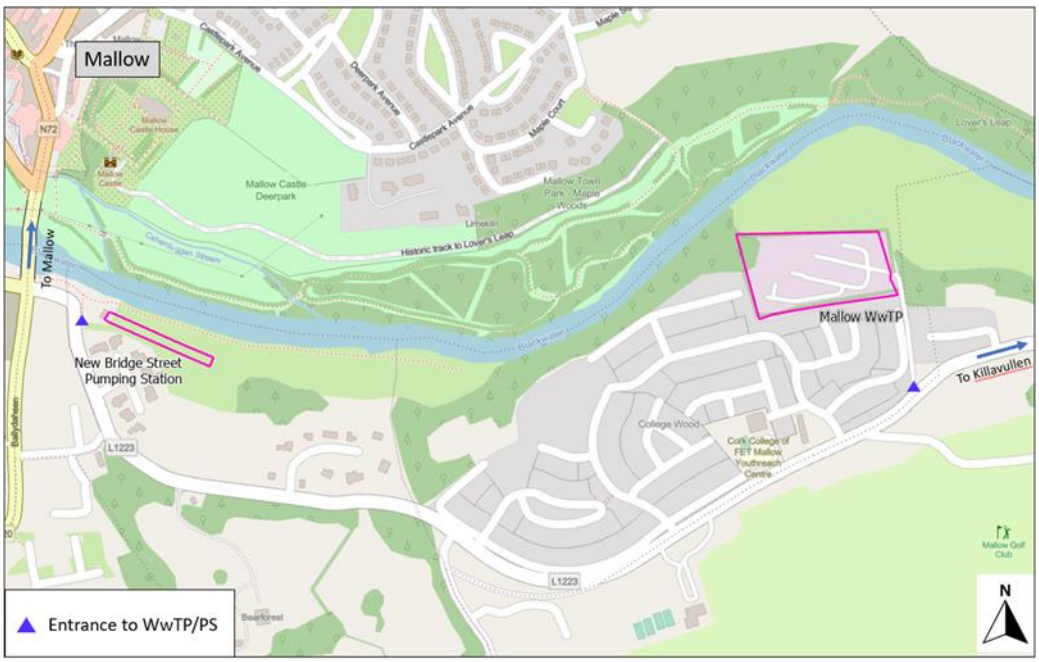

Figure 9.1 Access Arrangements To The WwTP And Pumping Station Sites.

9.4. Mitigation Measures

In the absence of potential negative significant effects on the transport network and traffic itself, there is no scope for mitigation.

9.5. Residual Impacts

There are no residual impacts predicted.

9.5.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

9.6. Monitoring

No specific monitoring measures are required in relation to traffic and transport, given the lack of direct effects resulting from the operational discharges.

9.7. Conclusion

Due to the nature of the operational discharges, significant impacts to Traffic and Transport are not envisaged.

10. AIR QUALITY & CLIMATE

10.1. Introduction

This Chapter of the EIAR prepared by AWN Consulting Ltd. is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Air Quality and Climate.

This includes a description of the assessment criteria, a brief overview of the existing environment and an assessment of potential impacts.

10.1.1. Statement of Authority

This assessment was completed by Ciara Nolan, a Senior Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is an Associate Member of both the Institute of Air Quality Management (AMIAQM) and the Institution of Environmental Science (AMIEnvSc). She has over 5 years of experience working in environmental consultancy focussing on air quality. She has prepared air quality and climate impact assessments for numerous EIARs for a range of projects including commercial, residential, industrial, pharmaceutical and data centre developments.

10.2. Assessment Criteria

10.2.1. Air Quality

Impacts to air quality are assessed against compliance with the Ambient Air Quality Standards Regulations 2011 (S.I. no. 180 of 2011). This incorporates EU directive 2008/50/EC which outlines ambient air quality limit values for a range of pollutants including nitrogen dioxide, particulate matter, lead, sulphur dioxide, benzene and carbon monoxide. Impacts are assessed against compliance with the relevant limit values. Where non-compliance is determined significant impacts to air quality, and subsequently human health, can occur. Any potential impacts are typically mitigated to ensure compliance with the relevant limit values is maintained and to ensure impacts are non-significant.

10.2.2. Climate

Ireland has annual greenhouse gas (GHG) emission targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*, which has set a target of 30% reduction in non-emissions trading scheme (ETS) sector GHG emissions by 2030 relative to 2005 levels. The 2021 Climate Action Plan details the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets which allow for sectorial assessment criteria. The sectorial emission ceilings for 2030 were published July in 2022.

10.3. Receiving Environment

10.3.1. Air Quality

Ireland has been divided into four air quality zones for air quality management and assessment purposes. Dublin City and its environs are defined as Zone A, Cork City and environs are defined as Zone B, Zone C comprises 23 towns with a population greater than 15,000 and Zone D comprises the remainder of Ireland. Mallow and the area of the development fall within Zone D.

Data from EPA monitoring reports[17] over the past number of years indicates that there is generally a good level of air quality in Zone D locations, with monitored pollutant concentrations in compliance with the Ambient Air Quality Standards Regulations 2011 limit values. The EPA note that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$).

10.3.2. Climate

The EPA have stated that in 2021 the GHG emissions for Ireland that are covered under the Effort Sharing Regulation (EU 2018/842) were 46.19 Mt CO_2eq which is 2.71 Mt CO_2eq more than the annual limit for 2021[18]. EPA projections indicate that Ireland can achieve compliance under the ESR over the 2021-2030 period provided there is full implementation of the 2021 Climate Action Plan[19]. The EPA projections indicate that implementation of all climate plans and policies, plus further new measures, are needed for Ireland to meet the 51% emissions reduction target and put the country on track for climate neutrality by 2050.

10.4. Description of Likely Significant Effects

10.4.1. Air Quality

The Project involves two operational discharges to waterbodies in the form of a Primary Discharge (SW001) and a Dual Function Overflow (SW010). The Dual Function Overflow *i.e.,* an overflow that acts as a SWO and an EO depending on the circumstances. Due to the nature of the operational discharges, there are no air quality emissions to atmosphere associated with The Project. Therefore, there is no predicted impact to air quality as a result of the operational discharges under normal operations.

The development will allow for an EO from the new Bridge Street Pumping Station (SW010). Provision for a standby power supply will be made at the new Bridge Street Pumping Station for continued operation of the pumping equipment in the event of an interruption in the power supply. There will be some emissions to atmosphere in relation to the back-up generators in the form of NO_2, PM and CO_2 emissions. However, emissions from the generator will have an imperceptible impact on local air quality due to the small

[17] Environmental Protection Agency (2021) Air Quality in Ireland 2020 (& previous annual reports)
[18] Environmental Protection Agency (2022) Ireland's Provisional Greenhouse Gas Emissions 1990 – 2021
[19] Environmental Protection Agency (2022) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2021 - 2040

number required (1 no.) and it will only be required for use during emergency events, which will be a very rare occurrence (Refer to **Chapter 3**).

It can be concluded that the Project will have an imperceptible impact on Air Quality.

10.4.2. Climate

As stated above, the Project will involve two operational discharges to the aquatic environment. There will be no GHG emissions associated with the discharges themselves. Therefore, there is no predicted impact to climate as a result of the proposal during normal operations.

Emissions of CO_2 from the back-up generator associated with SW010 (1 no. generator) are not predicted to have any significant impact to climate. The generator will be required for use in emergency events only, when there is an interruption to the power supply for the site, which will be a very rare occurrence. There is only one no. generator proposed for the Bridge Street Pumping Station at SW010, therefore CO_2 emissions when compared to emissions targets will be imperceptible.

10.5. Mitigation Measures

In the absence of potential negative significant effects, no mitigation is required.

10.6. Residual Impacts

There are no residual impacts predicted.

10.6.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

10.7. Monitoring

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

10.8. Conclusion

Due to their nature, no significant Air Quality and Climate impacts are predicted from the operational discharges, SW001 & SW010.

11. NOISE & VIBRATION

11.1. Introduction

This Chapter of the EIAR prepared by AONA Environmental Consulting Ltd. is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Noise & Vibration.

This includes a brief overview of the proximity of the nearest residential properties to the operational discharges and an assessment of potential noise impacts. There are no construction works proposed as part of the development as it is already permitted.

11.1.1. Statement of Authority

This assessment has been prepared by Mervyn Keegan. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including Air Quality & Climate impact assessment and mitigation design. Mervyn Keegan has over 23 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Air Quality Management and the Institute of Environmnetal Sciences, with a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of 50 Noise & Vibration and Air Quality & Climate impact assessments per annum for a range of developments in the Republic of Ireland, Northern Ireland and the UK in the last 15 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

11.2. Receiving Environment

The proximity of the nearest residential properties to the operational discharges which are the subject matter of the EIAR are listed in **Table 11.1** below.

There are a number of sensitive residential properties within 500m of the discharge locations; primarily within residential housing estates at Castlepark and College Wood, also within Mallow town and along the R619.

Table 11.1 Proximity of The Nearest Residential Properties to The Operational Discharges Relating to The Mallow WWDA review

Discharge Name	Type	Asset	Discharge Location (NGR)	Proximity to the nearest residential property
SW001	Primary Discharge	WwTP	157530E 098140N	~165m
SW010	Dual Function Overflow (Storm Water Overflow & Emergency Overflow)	New Mallow Bridge Street Pumping Station	156636E 097862N	~120m

11.3. Description of Likely Significant Effects

No mechanical plant will be required to operate a penstock gate on the operational discharges. Therefore, the operational discharges will be completely inaudible at both the nearest noise sensitive locations and the nearest public amenity area or walkway, other than the sound of the flow of the primary effluent/stormwater, which is akin to the sound of the existing flows in the River Blackwater. Therefore, the Noise and Vibration impact from the operational discharges will be negligible.

Noise emission from the back-up generator associated with SW010 (1 no. generator) are not predicted to have any significant noise impacts. The generator will be required to be used in emergency events only, when there is an interruption to the power supply for the Bridge Street Pumping Station, which will be a very rare occurrence. If the generator was required to provide power supply, its use would be expected to last a maximum of a few hours. The impact is therefore considered to be negligible.

Otherwise, occasional noise impacts during the operational phase of The Project will be limited to works associated with maintenance of the outfall which may include occasional operation of plant and equipment to remove trapped detritus from the discharge points.

It is expected that whilst such maintenance works may generate short-term periods with audible noise levels in the surrounding proximity, it would be expected that such maintenance works would last a maximum of a few hours and may only occur once or twice a year during the daytime period. The impact of these activities is therefore considered to be negligible.

Future and / or on-going noise monitoring of the operational discharges is not deemed necessary.

11.4. Mitigation Measures

In the absence of potential negative significant effects, no mitigation is required.

11.5. Residual Impacts

There are no residual impacts predicted.

11.5.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

11.6. Monitoring

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

11.7. Conclusion

Due to their nature, no significant Noise and Vibration impacts are predicted from the operational discharges, SW001 & SW010.

12. ODOUR

12.1. Introduction

This Chapter of the EIAR prepared by AWN Consulting Ltd. is concerned with the likely significant effects of the Mallow agglomeration operational discharges on Odour.

This includes a description of the assessment criteria used and an assessment of potential impacts.

12.1.1. Statement of Authority

This assessment was completed by Ciara Nolan, a Senior Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is an Associate Member of both the Institute of Air Quality Management (AMIAQM) and the Institution of Environmental Science (AMIEnvSc). She has over 5 years of experience working in environmental consultancy focussing on air quality. She has prepared air quality (including odour) and climate impact assessments for numerous EIARs for a range of projects including commercial, residential, industrial, pharmaceutical and data centre developments.

12.2. Assessment Criteria

The impact to nearby receptors as a result of potential odorous releases depends on the intensity of the odour and the length of time the population may perceive the odour. The Environmental Protection Agency (EPA) has issued guidance in relation to odour assessments entitled "*Odour Emissions Guidance Note (AG9)"*[20]. This guidance recommends that odour standards should vary from 1.5 – 6.0 OU_E/m^3 as a 98th%ile of one hour averaging periods at the worst-case sensitive receptor based on the offensiveness of the odour and with adjustments for local factors such as population density. WwTP processes fall into the "*Most Offensive*" category which has an odour threshold of 1.5 OU_E/m^3 as a 98th %ile of one hour averaging periods at the worst-case sensitive receptor. This odour threshold can be applied to the discharge locations as a conservative approach. However, as the water will be treated prior to discharge it is unlikely to be particularly odorous.

12.3. Receiving Environment

There are two operational discharges to waterbodies in the form of a primary discharge (SW001) and a Dual Function Overflow at Bridge Street Pumping Station (SW010) *i.e.,* an overflow that acts as a Storm Water Overflow and an Emergency Overflow.

There are a number of sensitive residential properties within 500m of the discharge locations; primarily within residential housing estates at Castlepark and College Wood, also within Mallow town and along the R619.

[20] *Environmental Protection Agency (2019) Odour Emissions Guidance Note (AG9)*

12.4. Description of Likely Significant Effects

It is not predicted that there will be odorous emissions associated with these discharges. The primary discharge SW001 will be treated prior to release thereby minimising the potential for odour.

In terms of SW010, a SWO event will lead to a highly diluted screened effluent being discharged to the River Blackwater. It is not possible to fully retain all stormwater at the Pumping Station due to septicity that arises with storage and the inability of treatment plant biological processes to cater for large volumes of dilute wastewater. Diluted, settled and screened effluent which could be discharged during storm conditions, will have increased flows driven by sustained rainfall. In this context, the SWO discharges *via* SW010 will be highly diluted and will not be odorous. Any odours associated with the development will be imperceptible.

Provision for a standby power supply will be made at Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the highly unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater River *via* the EO (SW010). In this context, emergency discharges from SW010 will be highly unlikely and where they do occur, they will be short (few hours) in duration. Odours associated with emergency discharges will be imperceptible.

12.5. Mitigation Measures

In the absence of potential negative significant effects, no mitigation is required.

12.6. Residual Impacts

There are no residual impacts predicted.

12.6.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

12.7. Monitoring

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

12.8. Conclusion

Due to their nature, no significant Odour impacts are predicted from the operational discharges, SW001 & SW010.

13. ARCHAEOLOGY, ARCHITECTURAL & CULTURAL HERITAGE

13.1. Introduction

This Chapter of the EIAR prepared by Courtney Deery Archaeological Consultants, is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Archaeology, Architectural & Cultural Heritage.

This Chapter includes a description of the assessment criteria, a brief overview of the existing environment, and an assessment of potential impacts.

13.1.1. Statement of Authority

This Chapter was prepared by Lisa Courtney. Lisa is a director of Courtney Deery Heritage Consultancy and has over 25 years of field and research experience in environmental impact assessment reporting. Lisa holds a BA (Hons) in Archaeology and Economics and a Msc (Ag) in Environmental Resource Management from University College Dublin and has obtained certificates from the University of Oxford in Condition Surveys of Historic Buildings (2017) and the assessment of setting of heritage assets (2013). Lisa holds a higher diploma in Planning and Environmental Law (2020). Lisa is a member of the Institute of Archaeologists of Ireland (IAI) and a member of the International Council of Monuments and Places (ICOMOS). Lisa has carried out reports for large-scale infrastructural projects and conservation initiatives, her experience demonstrates a capability of characterising the existing historic and archaeological environment and evaluating its significance.

13.2. Assessment Criteria

Cultural heritage sites are considered to be a non-renewable resource and cultural heritage material assets are generally considered to be location sensitive. In this context, any change to their environment, such as construction activity and ground disturbance works, could affect these sites. The likely significance of all effects is determined in consideration of the magnitude of the effects and the baseline rating of the cultural heritage asset (*i.e.,* its sensitivity or value). Having assessed the magnitude of effect with respect to the sensitivity/value of the asset, the overall significance of the effect is then classified as imperceptible, slight, moderate, significant, or profound.

This assessment relates to operational discharges only, and therefore there are no construction activities and/ or ground disturbance works.

13.3. Receiving Environment

The town of Mallow (CO033-093---) is located on the north bank of the Blackwater River. In the Annals, Mallow is called '*Magh-Ealla'* (Moyallo), meaning '*the plain of the River Allo'* which was the ancient name of the part of the Blackwater River, which flows through the town (www.logaimn.ie). The earliest reference to the town is a murage grant of 1286 (Thomas 1992), although there is no evidence for the survival of any upstanding sections of the town wall nor have any ever been found. The town, however, retains the appearance of a *'street town',* which may have had a rectangular circuit extending from Short Castle at the northwest to Mallow Castle and bridge at the southeast. Property plots end at the

river meadows at the south and fields at the north demarking a possible walled area about the size of Kinsale.

Mallow Castle stands on the site of an earlier castle built by the Fitzgerald Earls of Desmond who owned the Manor of Mallow from medieval times. The crossing point of the Blackwater River was of strategic importance as it was the main routeway from Cork to Limerick and the first castle to be constructed here guarded this crossing on the orders of King John (Heritage Unit of Cork County Council, 2020). It is probable that the settlement that is now Mallow developed after that (Thomas, 1992). By 1612, the town of Mallow received its first charter from James I, becoming incorporated and made a free borough, with a market and two fairs (Lewis, 1837). In 1997 during archaeological testing at Bridge Street on the north side of Mallow Bridge, directly outside the west wall of Mallow Castle demesne, some possible habitation levels dating to the 17th century were uncovered at depths of *ca*.2.2m (Lane, 1997). Archaeological investigations at Davis Street in front of the Clock House, uncovered possible 17th century levels at a depth of *ca.* 2.35m (Lane 2000). The castle was in turn replaced by a fortified house, *'Mallow Castle'*, in 1599 by Sir Thomas Norreys, Lord President of Munster (Bence-Jones, 1978). The foundations of the tower house were discovered by Leask within the interior of this later fortified house (Zajac *et al*., 1995). *'Mallow Castle'* was attacked on many occasions during the 17th century and finally burnt down in 1689 by order of King James II (Hajba, 2002). It still remains as a ruin today on the north bank of the River Blackwater.

The site of another castle, Short Castle, built in the early 17th century, lies on the west side of Shortcastle Street. This castle, also known as '*Castle Garr'* is listed in the Urban Archaeological Survey of County Cork (Zajac *et al*., 1995). The only historical evidence for this castle is that an intense battle took place there in 1642 after which it was destroyed (Power and Lane *et al.,* 2000). Those who died during this battle are said to be buried 'in the adjoining garden' (Zajac, 1995) although the exact '*garden'* is not known.

During the 18th and 19th centuries Mallow town became a thriving market and spa town. Many buildings within the town date to this period and are of historic and archaeological interest. These include a Market House, St. Mary's Church of Ireland church and graveyard, a Roman Catholic Church, a railway station and '*Spa House'* built over Spa Well. The ruins of Mallow Hospital, the County Infirmary, are located in the grounds of Mallow Castle Demesne adjoining the west end of farm buildings.

Mallow Bridge connecting the townlands of Ballydahin and Castlelands, was built over the River Blackwater in 1856 but incorporates parts of an earlier bridge dating to 1712. A bridge is shown at this site on a Down Survey map of 1654-9. Clyda Bridge over the River Clyda links the townlands of Clyda and Quartertown. Its date of construction is unknown but it is described in the Inventory as being of 18th - century appearance (Power & Lane *et al.,* 2000).

Mallow Railway Station lies at the northwest of the town, on the west side of the N20. This station was built in 1849 and comprises a number of well-built buildings with slate and corrugated roof canopies over the platforms (Power & Lane *et al.,* 2000). A holy well, *'Toberaroughta'*, is depicted to the north of the railway station on the OS maps of 1842 and 1904 and as '*site of'* on the 1935 map. There are five railway bridges in the vicinity of the town. The bridge in Annabella lies to the southwest and is still in use. The other bridges in Leaselands/Spaglen, Kilknockan/Lackanalooha, Lackanalooha and Ballyviniter Lower formed part of the Great Southern Railway line, Mallow - Fermoy and are now disused. A surveyor's map of 1849 shows how the Mallow-Ballyclough Road was turned

southwards to meet Navigation Road on the west side of the railway line, in order to avoid building two railway bridges (Myers, 2001).

13.3.1. Planning Context: Mallow Sewerage Scheme Upgrade Project

This Mallow Sewerage Scheme Upgrade Project received the final grant of planning on the 13th of January 2022 subject to 41 conditions (Cork County Council Planning Register Number: 195078). Cultural heritage and archaeological conditions are as follows:

Condition 40.

Any historic elements of the streetscape that will be removed as a consequence of the works shall be re-instated to the satisfaction of the Planning Authority. Details/samples of the proposed finishes for the reinstatement of road surface/ footpaths/ street furniture etc within the ACA shall be submitted to and agreed with the planning authority before the commencement of works.

Condition 41.

The applicant is required to engage the services of a suitably qualified archaeologist to monitor under licence from the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht (DCH&G) all ground works associated with the development. No ground works/ construction works / soil stripping are to take place in the absence of the archaeologist. In the event that archaeological material is found during the course of monitoring, the archaeologist shall have work on the site immediately stopped and notify the Local Authority Archaeologist and National Monuments Service. The developer shall be prepared to be advised by the Local Authority Archaeologist and the National Monuments Service in regard to any necessary mitigating action and allow enough time to facilitate implementation of the agreed mitigation measures. The applicant shall facilitate the archaeologist in recording any material found. The Planning Authority and the National Monuments Service shall be furnished with a report describing the results of the monitoring.

13.4. Description of Likely Significant Effects

The subject matter of this EIAR are the operational discharges to the River Blackwater in the form of a primary discharge (SW001) and Dual Function Overflow (SW010) *i.e.,* an overflow which can act as a SWO or as an EO depending on the circumstances.

The operational discharges (SW001 and SW010) will take place within the existing and newly improved built infrastructure as a result of the Mallow Sewerage Scheme Upgrade Project. As per the grant of permission, condition 41, all work is being archaeologically monitored and the developer will be advised by the Local Authority and the National Monuments Service in regard to any necessary mitigation action.

As a result of the operation discharges, no physical impacts are anticipated on Archaeology, Architectural & Cultural Heritage assets.

13.5. Mitigation Measures

In the absence of potential negative significant effects, no mitigation is required.

13.6. Residual Impacts

There are no residual impacts predicted.

13.6.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

13.7. Monitoring

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

13.8. Conclusion

Due to their nature, no significant Archaeology, Architectural & Cultural Heritage impacts are predicted from the operational discharges, SW001 & SW010.

14. LAND, SOILS & GEOLOGY

14.1. Introduction

This Chapter of the EIAR prepared by AWN Consulting Ltd, is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Land, Soils and Geology, including Hydrogeology.

This includes a description of the assessment criteria, a brief overview of the existing environment, and an assessment of potential impacts.

14.1.1. Statement of Authority

This report was prepared by Marcelo Allende (BSc, BEng), a Senior Environmental Consultant (Hydrologist) at AWN Consulting Ltd. with over 17 years of experience in Environmental Consulting as well as hydrological and hydrogeological technical studies. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide of range of projects including multi-aspect environmental investigations, geo-environmental impact assessments, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments, Due Diligence reporting, baselines studies, soils, surface water and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama. He also has detailed knowledge of environmental guidance, legislation, regulations & standards, and expertise in GIS (expert level) and MATTE studies at COMAH establishments. He is currently a member of the International Association of Hydrogeologists (IAH, Irish Group) and a member of Engineers Ireland (MIEI).

14.2. Assessment Criteria

The baseline assessment has been carried out in accordance with the following guidance and established best practice:

- Environmental Protection Agency (EPA) Advice notes on current practice in the preparation of Environmental Impact Statement (EPA, 2003) and Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2022a);
- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009);
- Water Framework Directive (WFD) - Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. This relates to the improvement of water quality across Ireland including rivers and groundwater bodies;
- River Basin Management Plan 2018-2021 (including regional plans by Local Authority Waters Programme (Waters and Communities 2020)). Draft River Basin Management Plan 2022-2027; and

- Institute of Geologists Ireland (IGI) -Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).

Groundwater resource management in Ireland is dealt with in the following key pieces of legislation and guidelines:

- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010);
- European Communities Environmental Objectives (Groundwater) Amendment Regulations 2016 (S.I. No. 366 of 2016); European Communities Environmental Objectives (Groundwater) (Amendment) Regulations 2022 S.I. No. 287 of 2022;
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003); and
- Environmental Protection Agency '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland Interim Report'*, (EPA 2003).

14.3. Receiving Environment

The Mallow Wastewater Treatment Plant (WwTP) is located at Ballyellis, Mallow, next to the Blackwater River. The new Mallow Bridge Street Pumping Station at Bearforest Lower, west of the WwTP, and also on the banks of the River Blackwater.

According to the Geological Survey of Ireland (GSI) website, the lithology at the WwTP site is underlain by cohesive and low permeable deposits (Tills); alluvial and urban deposits are also located beneath the surrounding area. The bedrock geology underlying the location of the treatment facility and surrounding area is mapped as Waulsortian Limestones (rock unit code: CDWAUL) which is described as '*pale-grey, crudely bedded or massive limestone*'. The bedrock geology underlying the treatment facility has been classified by the GSI as a '*Regional Important Aquifer – Karstified (diffuse) (Rkd)*'. There are no gravel aquifers mapped within a 15km radius of The Project (GSI, 2022).

Groundwater vulnerability in the vicinity of the treatment facility was generally mapped ranging from '*High*' to '*Extreme*' (GSI, 2022). Groundwater vulnerability is based on the thickness of the subsoil overlying the bedrock aquifer. The classification of '*High*' to '*Extreme*' indicates that the soil overlying the bedrock aquifer has a depth between 0-5 m. Local groundwater would therefore be considered as a sensitive receptor due the thickness of this overburden.

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of '*Good Status*' in water bodies that are of lesser status at present and retaining '*Good Status*' or better where such status exists at present. '*Good Status*' was to be achieved in all waters by 2015, or at least by 2027, as well as maintaining '*High Status*' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

There is one (1) no. groundwater body (GWB) in the region of The Project. According to the EPA maps, the Mitchelstown GWB (IE_SW_G_082) is underlying The Project site. Based on the 2013-218 WFD status, Mitchelstown GWB is classed as having '*Poor Status'*, with a Ground Waterbody Risk score of '*At Risk of Not Achieving Good Status*'. The Mitchelstown GWB has a Good Status for quantitative category, however, is it was considered poor due to the chemical status of the overall GWB. The overall status is considered *"Poor"* due to "*Nitrate (as NO3) Failure for Chemical Status SW_G_082"*. However, based on most recent monitoring of this groundwater body by the EPA (2016-2021), this groundwater body is considered '*Good Status'*.

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. This current index does not show any wells drilled or springs at the site or surrounding area, with the exception of a single old domestic well in Ballyellis (probably inactive at present). The area is serviced by Local Authority mains, therefore, it is unlikely that any wells are used for potable supply. The site is not located near any public groundwater supplies or group schemes. There are no groundwater source protection zones in the immediate vicinity of the site; the nearest groundwater protection area is the Olivers Cross Public Water Supply (PWS) and is located *ca*. 1.5km to the north of the Project site.

On the basis of the natural protection provided by the soil and poor hydraulic connectivity in the aquifer, there is no likely pathway through the soil and aquifer to Blackwater River protected areas or Lower Blackwater Estuary/ Youghal Bay/ Western Celtic Sea further away.

There are no sensitive soil receptors, and no identified areas of geological heritage or groundwater supplies in the vicinity of the operational discharges. The closest geological heritage site is the Lady's Well in Mallow, which is an old warm spring located *ca.* 1.1km to the northwest of the subject site, across the Blackwater River.

14.4. Description of Likely Significant Effects

A site-specific WFD Screening Assessment was carried out for the operational discharges and is attached as **Appendix 3 - Water Framework Directive Screening Assessment.**

Overall, this WFD Screening Assessment has shown that there is no potential for change in the groundwater water body status and no risk as a result of the operational discharges.

Due to the nature of the operational discharges, no potential impacts to the land, soil, geological or hydrogeological environment were identified as there is no discharge to ground or active dewatering associated with the discharges.

It can be concluded that the Mallow agglomeration operational discharges, SW001 and SW010, will have an imperceptible impact on Land, Soil and the Geological and Hydrogeological environment.

14.5. Mitigation Measures

In the absence of potential negative significant effects, no mitigation is required.

14.6. Residual Impacts

There are no residual impacts predicted.

14.6.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

14.7. Monitoring

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

14.8. Conclusion

Due to their nature, no significant Land, Soil, Geological or Hydrogeological impacts are predicted from the operational discharges, SW001 & SW010.

15. LANDSCAPE & VISUAL

15.1. Introduction

This Chapter of the EIAR prepared by Stephenson Halliday, is concerned with the likely significant effects of the Mallow agglomeration operational discharges (SW001 and SW010) on Landscape and Visual factors.

This includes a description of the assessment criteria, a brief overview of the existing environment, and an assessment of potential impacts.

15.1.1. Statement of Authority

This Chapter has been prepared by Daniel Leaver, an Associate Director Stephenson Halliday with over 25 of experience in the field of Landscape Architecture. Dan is a Chartered Landscape Architect with considerable experience of the coordination, delivery and technical review of LVIAs. He is an experienced project manager and has been involved in work in the UK, Ireland and overseas. Projects have included the assessment of a wide range of developments, including residential and commercial, minerals, waste disposal and energy including renewables, opencast sites, rail, highways and other infrastructure projects.

15.2. Assessment Criteria

The assessment of landscape and visual effects has been informed by the [21]Landscape Institute's Guidelines for Landscape and Visual Impact Assessment (3rd Edition, 2013). This review has been undertaken through a combination of desk study of plans and relevant reports and the use of aerial photos, Google Earth, and Street View.

15.2.1. Planning Context

The following policies from the Cork County Development Plan 2022 are considered relevant to the application site as follows:

GI 14-9: Landscape

a) Protect the visual and scenic amenities of County Cork's built and natural environment.

b) Landscape issues will be an important factor in all land-use proposals, ensuring that a pro-active view of development is undertaken while protecting the environment and heritage generally in line with the principle of sustainability.

c) Ensure that new development meets high standards of siting and design.

d) Protect skylines and ridgelines from development.

e) Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments.

[21] *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA 3). Landscape Institute (LI) and the Institute for Environmental Management and Assessment (IEMA) (2013)*

GI 14:10: Draft Landscape Strategy

Ensure that the management of development throughout the County will have regard for the value of the landscape, its character, distinctiveness and sensitivity as recognised in the Cork County Draft Landscape Strategy and its recommendations, in order to minimize the visual and environmental impact of development…

In addition, the Mallow Town Development Plan sets out the following relevant policy:

EH1-2 *Proposals for development within the designated ecological and/or amenity areas including the River Blackwater Special Area of Conservation … shall only be permitted, where it is in accordance with the remaining objectives of appropriate environmental assessment, demonstrate that it would not result in significant adverse effects on the receiving environment or the designation.*

EH2-1 *The Blackwater Corridor shall be retained as an undeveloped green corridor for recreational and amenity use. Proposals inconsistent with passive and/or active recreational use of these areas shall not be permitted.*

15.3. Receiving Environment

15.3.1. Landscape

The Cork County Draft Landscape Strategy identifies the study area as Landscape Character Area (LCA) 5: Fertile Plain with Moorland Ridge. LCA 5 is deemed to be of County importance and to have a generally very high sensitivity and very high value. It is noted that the operational discharge points are contained within a peri-urban environment and do not impinge to any great extent on the surrounding countryside.

The strategy makes the following recommendation relevant to the site:

- *Continue to promote and protect Mallow Racecourse and the River Blackwater as the primary visitor attractions in this Landscape Type.*

The operational discharge points are located within the Blackwater Corridor which is part of a High Value Landscape.

15.3.2. Visual

The operational discharge points are located within the banks of the Blackwater River and are therefore below the general level of the surrounding landscape. In addition, the banks of the river are generally well vegetated with mature tree and shrub vegetation which screens the infrastructure from wider views. Views are therefore limited to a very local area in the vicinity of each discharge point.

The Primary discharge point, SW001, will use a previously existing overflow whilst SW010 is a new overflow within very close vicinity to the previous Bridge Street Pumping Station outfall and any changes to location and form are minimal in nature.

15.4. Description of Likely Significant Effects

15.4.1. Landscape

There would be no changes to the existing site landscapes in terms of vegetation removal or changes to topography and the infrastructure is of a very similar scale and nature to that of any previous structures. The operational discharge points were already present at, or very close to, the current locations, hence, there is no change to land use. It is therefore considered that the existing landscape would be tolerant to the infrastructure type.

Overall, it is considered that any changes to LCA 5 would be of such small scale and limited extent that they would be barely perceptible at a landscape scale. It is therefore considered that landscape effects would not be greater than negligible. It is also concluded that the scenic resource of Blackwater River would be retained intact.

15.4.2. Visual

Views of the operational discharge points are predominantly screened by existing topography, built form and vegetation and, where they are present there would be no or very little change to views. There would therefore be minimal changes to the visual amenity of users, including those using the Blackwater corridor for recreational and amenity use. Overall, it is considered that any potential changes to visual amenity would be of such small scale and limited extent that they would be barely perceptible. It is thus considered that visual effects would not be greater than negligible.

15.5. Mitigation Measures

In the absence of potential negative significant effects, no mitigation is required.

15.6. Residual Impacts

There are no residual impacts predicted.

15.6.1. Cumulative Impacts

There are no cumulative impacts with other projects or plans predicted.

15.7. Monitoring

No specific monitoring measures are required, given the lack of direct effects resulting from the operational discharges.

15.8. Conclusion

Due to their nature, no significant Landscape and Visual impacts are predicted from the operational discharges, SW001 & SW010.

16. RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

16.1. Introduction

This Chapter has been prepared by Nicholas O'Dwyer Ltd. and presents a consideration of risk of major accidents and/or disasters relevant to operational discharges (SW001 and SW010) as required in the EIA Directive and described in the EPA's EIAR 2022 Guidelines.

The aim is to determine any potential major accidents and/or natural disasters that the Project could (i) cause, and (ii) be vulnerable to; the potential for these major accidents and/or natural disasters to result in significant adverse environmental effects; and to determine appropriate measures required to prevent or mitigate likely significant adverse effects. It is noted that the Mallow WwTW has been designed to specific criteria to minimise or eliminate potential risk.

16.1.1. Statement of Authority

This Chapter has been prepared by Krista Farrugia, a Principal EIA Consultant in Nicholas O'Dwyer Ltd., with 19 years of experience in the field of EIA. As a consultant, Krista has coordinated EIAs, including Risk Assessment chapters, for 16 years. Krista has also conducted risk assessment for projects outside of EIA, as requested by the Competent Authority in Malta. Krista was also responsible for the review of risk assessments in her role as Environment Protection Officer for three years with the Malta Environment and Planning Authority (MEPA). Krista holds a Master of Science in Integrated Environmental Management from the University of Bath, a Post Graduate Diploma in Wildlife Biology and Conservation from Edinburgh Napier University, and a Bachelor of Science (Hons) in Chemistry and Biology from the University of Malta. She is a Practitioner with the Institute of Environmental Management with extensive experience in EIA.

16.2. Methodology

Generally, an environmental risk occurs when there is a means, or pathway by which a hazard (source) results in a negative impact to the surrounding environment, *i.e.*, receptor/s. Risk assessment includes identification, classification, and evaluation.

The following reference materials were used to inform and guide the assessment:

- EU (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report;
- EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports;
- EPA (2014) Guidance on Assessing and Costing Environmental Liabilities;
- DoEHLG (2010) Guidance Document 1: A Guide to Risk Assessment in Major Emergency Management;
- Dept of Defence (2017) A National Risk Assessment for Ireland 2017;
- Cork County Council Emergency Plan (2021); and
- ISO31010 Risk Assessment Techniques.

16.2.1. Risk Identification

Risks were identified through review of EIAR environmental factor Chapters and consultation with experts, as required. As set out in the EU guidance document, risks are identified both in respect of (i) the potential vulnerability of the Project (in this case in the context of the operational discharges) to major accidents and disasters; and (ii) the potential for the Project to cause accidents and/or disasters.

16.2.2. Risk Classification

16.2.2.1. Risk Assessment Criteria

The risk criteria applied in this assessment are based on a consequence/likelihood matrix consistent with *ISO31010: Risk Management: Risk Assessment Techniques*, a supporting standard for the international risk standard ISO31000. Reference was made to the DoEHLG and the EPA (2014) guidance documents; the following risk criteria were adapted for the purposes of this assessment. **Table 16.1** lists the criteria used for assessing environmental consequences. **Table 16.2** presents the criteria to determine the likelihood of an event occurring.

Table 16.1 Criteria for Assessing Scale of Environmental Consequences

Rating	Classification	Effects on natural environment
1	Insignificant	No contamination; localised, short-term effects to land, biodiversity, ecosystem services, water resources, human health
2	Minor	Limited contamination, short duration, localised effects to land, biodiversity, ecosystem services, water resources, human health
3	Moderate	Moderate, medium-term impacts with widespread effects to land, biodiversity, ecosystem services, water resources, human health
4	Major	Medium- to long-term, serious environmental effects with some impairment to ecosystem function, widespread impacts
5	Catastrophic	Permanent, severe impacts to land, biodiversity, ecosystem services, water resources, human health

Table 16.2 Criteria for Assessing Likelihood of Event Occurring

Rating	Classification	Effects description
1	Rare	Consequence may only occur in exceptional circumstances
2	Unlikely	Consequence could occur at some time
3	Occasionally	Consequence should occur at some time
4	Likely	Consequence will probably occur in most circumstances
5	Almost certain	Consequence is expected to occur in most circumstances

16.2.3. Risk Evaluation

The risk matrix was developed with reference to the guidelines, listed above in particular the EPA (2014) and the DoEHLG (2010) guidance documents. **Table 16.3** presents the matrix that was applied in carrying out the risk assessment.

Table 16.3 Risk Matrix

	Environmental Consequence				
Likelihood	**1: Insignificant**	**2: Minor**	**3: Moderate**	**4: Major**	**5: Catastrophic**
1: Rare	Low	Low	Low	Low	Low
2: Unlikely	Low	Low	Low	Moderate	Moderate
3: Occasional	Low	Low	Moderate	Moderate	High
4: Likely	Low	Moderate	Moderate	High	High
5: Almost Certain	Low	Moderate	High	High	High

16.3. Overview

The Project involves the operational discharges (SW001 and SW010) from the Mallow agglomeration to the sensitive Blackwater River, and therefore solely assesses potential operational risks related to these discharges.

The Mallow WwTP has been designed to IW design standards that ensure that the discharge parameters are compliant with proposed ELVs as detailed in **Section 3.4**. As described in **Chapter 3**, a WAC was carried out to verify that the proposed ELVs are fit for purpose and have been appropriately assigned to ensure that the receiving waterbody has the capacity to accommodate the proposed discharge from the upgraded WwTP without causing a breach in the relevant standards as outlined in National and European legislation.

However, should unexpected and unplanned for events occur during the operation of the WwTW, there is a risk of contamination of the receiving water body (the Blackwater River) that could then result in impacts on environmental impacts and impacts on ecosystem services.

The following design measures and mitigation to prevent overflows have been incorporated in the design and operation of the WwTW:

- The Dual Function Overflow (SW010) has been designed to meet the definition of '*Storm Water Overflow*' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995;
- A 2,400m^3 Stormwater Holding Tank will be provided at the new Pumping Station;
- Overflows from the Storm Water Holding Tank will be screened by a self-cleaning mechanical screen with a maximum passage of 6mm;
- All equipment at the WwTP is Duty/Standby with fault and high level alarms;
- The works will include the installation of a new SCADA and telemetry system, this system will ensure compliance and compatibility with Irish Water's Design Specifications;
- All alarms at the WwTP and Bridge Street Pumping Station will be linked to level measurement to alert to any spillage and will be linked to SCADA with alarms sent to operators in the result of an emergency event;
- Full formal training will be provided to the plant operators during the last 30 days of the Operation Service Period to ensure operators can run the works safely and successfully;
- Provision for a standby power supply will be made at Bridge Street Pumping station for continued operation of the pumping equipment in the event of an interruption in the power supply; and
- All flows will be monitored continuously and recorded by flowmeters which will be installed at the WwTP and Bridge Street Pumping Station.

The Mallow WwTW has been designed to prevent unintended discharges from the works and to ensure that all emissions from the agglomeration comply with or will not result in the contravention, of any national or European legislation.

16.4. Existing Environment

16.4.1. Natural Disasters

Given its geographical location, Ireland is relatively less vulnerable to natural disasters such as earthquakes or tsunamis. However, recently there has been an increase in the number of severe weather events, particularly those leading to flooding and flash flood incidents. Historically, Mallow has flooded many times. The Office of Public Works (OPW) (2019)[22] records that major floods occurred in 2010, 2009, 2008, 2004, 1998, 1995, 1988, 1980, 1969, 1948, 1875 and 1853. The most severe flood happened in 1853 when the town bridge was swept away.

16.4.2. Major Accidents

The following lists EPA Industrial Licenced Facilities within the Mallow agglomeration:

- P0403 - Dairygold Co-Operative Society Limited Mallow – Industrial Emissions Licence (IEL), located *ca*. 2km northwest of the WwTP;
- P0247 – Micam Limited – Industrial Pollution Control (IPC), located *ca*. 1.8km west of the WwTP;
- P1000 – Magh nAla Limited – IPC, located *ca.* 3km west of the WwTP;
- P0977 - Magh nAla Limited – IEL, located *ca*. 2.8km west of the WwTP.

There is also one Lower Tier Seveso Site within the Mallow agglomeration; the installation is a Gas Filling Station located in the Quarterstown Industrial Estate.

The occurrence of a major emission, fire or explosion could result in a major accident or disaster, which could be immediate or delayed and could result in off-site impacts.

16.5. Risk Assessment

A risk assessment was carried out using the classification and evaluation criteria described in **Table 16.1** to **Table 16.3**. **Table 16.4** presents the risk assessment in the absence of mitigation measures (or assuming complete failure of measures); **Table 16.5** presents the risk assessment with mitigation measures in place. It should be noted that all mitigation measures will be implemented.

[22] *Office of Public Works. 2019. Mallow Flood Defence Scheme.*

Table 16.4 Risk Levels Without Mitigation

Event	Environmental Consequence	Likelihood	Resultant Risk Level
Clogged inlet screens resulting in direct untreated effluent discharge to designated sensitive water body	Minor, localised effects of short-term duration, limited contamination	Likely	Moderate
Plant failure resulting in direct untreated effluent discharge to sensitive waters	Minor, localised effects of short-term duration, limited contamination	Occasionally	Low
Power failure leading to WwTP shutdown resulting in direct untreated effluent discharge to sensitive waters	Minor, localised effects of short-term duration, limited contamination	Occasionally	Low
Fire or explosion on site	Major, potentially serious resulting in high contamination and of potentially extended duration	Unlikely	Moderate
Flooding of WwTP due to severe weather conditions resulting in uncontrolled releases of untreated wastewater into Blackwater River	Minor, localised effects of short-term duration, limited contamination	Unlikely	Low
Incident at nearby Seveso site resulting in an off-site impact, which could include fire/explosion, or equipment/infrastructure failure if high concentrations of contaminants enter the system	Major, potentially serious resulting in high contamination and of potentially extended duration	Unlikely	Moderate

Low to very low risk would determine that the risk levels are acceptable, however, potential moderate and high-risk scenarios require further mitigation, apart from the inbuilt design that is related to the operational discharges. The events and the effects on the risk level are assessed in **Table 16.5**.

Moderate risks were identified with respect to potential clogging of inlet screens without the design mechanisms in place (which would alert the system and redivert the discharge to the holding tank until the screens were unclogged). Potential damage to the biological treatment process as a result of an event whereby highly concentrated toxic influent is sent to the WwTP was also identified as a moderate risk given that it is unlikely, however, with potentially serious consequences. A fire or explosion is unlikely, however, effects could result in damage to the WwTP, as well as potential contamination of the watercourse unless runoff is contained. Potential flooding will result in a limited consequence, dilution of any untreated discharge will limit effect from contamination, with effects of a short duration.

Table 16.5 Risk Levels with Mitigation

Event	Mitigation measures	Environmental Consequence	Likelihood	Resultant Risk Level
Clogged inlet screens resulting in direct untreated effluent discharge to designated sensitive water body	Self-cleaning screens; Stormwater Holding Tank in case of clogging until maintenance can be carried out to unclog the screens.	Minor, localised effects of short-term duration, limited contamination	Unlikely	Low
Incident at nearby Seveso site resulting in an off-site impact, which could include fire/explosion, or equipment/infrastructure failure if high concentrations of contaminants enter the system	Dilution to a treatable concentration; lower tier Seveso site, which requires the site to prepare an Internal Emergency Plan, which details the systems that exist to deal with emergencies and the	Moderate, with potentially medium-term impacts and widespread effects	Rare	Low

Event	Mitigation measures	Environmental Consequence	Likelihood	Resultant Risk Level
	expected response.			
Fire or explosion on site	Emergency Response Plans	Moderate, with potentially medium-term impacts and widespread effects	Unlikely	Low

16.6. Conclusion

As provided in **Table 16.5**, the resultant risk level for the potential events, as relating to operational discharges, are considered to be low with all mitigation and design measures in place. However, IW will regularly assess the risk of major accidents and/or disasters.

17. INTERACTIONS

This Chapter of the EIAR has been prepared by Nicholas O'Dwyer Ltd. and considers the potential for interactions and inter-relationships between the factors of the environment, that have been examined individually throughout this EIAR, which could result in an impact being either positive or negative, as well as having varying levels of significance.

The preceding chapters of this EIAR assessed the likely significant effects that may occur as a result of the Mallow agglomeration operational discharges in terms of Biodiversity, Water, Population and Human Health, Material Assets, Traffic and Transport, Air Quality and Climate, Noise and Vibration, Odour, Archaeology, Architectural and Cultural Heritage, Land, Soils and Geology and Landscape and Visual.

The Chapter is directed by Article 3 section 1 (e) of Directive 2014/52/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment. The EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2022) and Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) were also considered.

Article 3 of the Directive states:

> *1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> *(a) population and human health;*
>
> *(b) biodiversity, with particular attention to species and habitats protected under Directive*
>
> *92/43/EEC and Directive 2009/147/EC;*
>
> *(c) land, soil, water, air and climate;*
>
> *(d) material assets, cultural heritage and the landscape;*
>
> ***(e) the interaction between the factors referred to in points (a) to (d)***

For the assessment of interacting effects, a matrix has been provided in **Table 17.1** identifying, through professional judgment, the specific topics within the EIAR where the effects potentially interact/inter-relate with each other.

Table 17.2 provides the likely interactive effects for the Mallow agglomeration operational discharges based on the individual assessments as contained in **Chapters 5 – 15**, and best scientific knowledge.

This Chapter of the EIAR addresses the interactions between the various environmental aspects of the Mallow operational discharges (*i.e.*, SW001 and SW010) covered in **Sections 5 - 15**.

Table 17.1 Interactive Effects Summary Matrix

Interaction With	Biodiversity	Water	Population & Human Health	Material Assets	Traffic & Transport	Air Quality & Climate	Noise & Vibration	Odour	Archaeology, Architecture & Cultural Heritage	Land, Soils & Geology	Landscape & Visual
Biodiversity		✓	✓								
Water			✓								
Population & Human Health											
Material Assets											
Traffic & Transport											
Air Quality & Climate											
Noise & Vibration											
Odour											
Archaeology, Architecture & Cultural Heritage											
Land, Soils & Geology											
Landscape & Visual											
√ =Interactive Effect											

Table 17.2 Interactive Effects of The Operational Discharges

Operational Discharge	Environmental Factors	Summary of Effect	Further Information
SW001	Water Biodiversity Population & Human Health	The primary discharge standards will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats and designations (*e.g.*, European sites, Salmonid Water, Designated Freshwater Pearl Mussel (*Margaritifera Margaritifera*) in the wider environs or downstream of the agglomeration. The operation of the upgraded WwTP and network is expected to have a positive impact in terms of a reduction in the levels of nutrients being discharged in the Blackwater River. Improvements to water quality will have a positive impact on water based recreational activities and amenity.	Slight positive, long-term effect. Refer to **Chapters 5, 6** and **7.**
SW010	Water Biodiversity Population & Human Health	Elimination in so far as possible of unintended discharges from the agglomeration. The single SWO remaining in the upgraded sewerage network meets the required design criteria, and calculations based on network modelling indicates that this SWO would meet the UPM high-status discharge criteria for intermittent discharges. The risks of sewer or outfall failure associated with extreme events resulting in the activation of Emergency Overflows (*via* SW010), while a theoretical risk (as the failure of any infrastructure in catastrophic situations is theoretically possible), is not reasonably predicted to occur. Their inclusion in the agglomeration prevents the risk of uncontrolled emissions arising from other points in the network and spilling onto land or water in an unpredictable manner. All appropriate design measures and mitigation to prevent Emergency Overflows that can be applied has been incorporated in	Slight positive, long-term effect. Refer to **Chapters 5, 6** and **7.**

Operational Discharge	Environmental Factors	Summary of Effect	Further Information
		the design and operation of the agglomeration. The Dual Function Overflow and its operational design will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats and designations (*e.g.*, European sites, Salmonid Water, Designated Freshwater Pearl Mussel (*Margaritifera Margaritifera*) in the wider environs or downstream of the agglomeration. Potential improvements to water quality and improved opportunities for water based recreational activities and amenity.	

Biodiversity, Water and Population & Human Health are the factors identified where interaction of effects may occur as a result of the operational discharges.

Potential interactions are summarised as follows:

- **Biodiversity & Water:** The upgrade works to the WwTP and associated effluent discharge standards and the operational design of the Dual Function Overflow from the new Bridge Street Pumping Station will ensure that the operational discharges from the agglomeration (i) contribute towards maintaining at least Good status of the Blackwater(Munster)_140 and the High WFD status of Ammonium and Ortho-phosphate and (ii) will ensure that there is no environmental risk posed to the receiving water environment and its associated designation as a result of the discharges from the agglomeration. The above, together with the RBMP measures tackling key pressures in the catchment, will contribute toward the restoration of high-status water quality conditions in the waterbody, as required by the FWPM Regulation Standards. The resultant improvement in water quality will have a slight positive long-term impact on the identified Key Environmental Receptors *i.e.,* the river habitat, aquatic sensitive water dependent fauna, otter, and birds that rely on the river.

  The operational discharges will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats and designations (*e.g.,* European sites, Salmonid Waters, Designated Freshwater Pearl Mussel (*Margaritifera Margaritifera*) in the wider environs or downstream of the agglomeration.

- **Water & Population & Human Health:** Improvements to the water quality of the Blackwater River, as descripted in **Chapter 6,** will positively impact on Population & Human Health. The WFD Screening assessment (**Appendix 3**) has shown that there is no potential for a negative impact in the water body status or risk as a result of the operational discharges. Therefore, there will be no significant negative

impacts on Population and Human Health. A slight positive effect has been identified on water quality, which will in turn have a slight positive effect on Population and Human Health. Potential impacts on Population & Human Health are addressed in **Chapter 7.**

18. SCHEDULE OF MITIGATION MEASURES

Following an examination, analysis, and evaluation of the direct and indirect effects of the Mallow operational discharges (*i.e.*, SW001 and SW010) in the foregoing Chapters, it was determined that the operational discharges would have no likely significant negative effects on any environmental factors. Therefore, no mitigation measures are required.

To ensure the satisfactory operation of the Mallow WwTW in line with the current WWDL D0052-01, and future reviewed licence requirements, the authors of this EIAR have put forward the following recommendations to be implemented:

- Ensure that the design capacity (22,000 p.e.) of the WwTP is not exceeded.
- All flows will be monitored continuously and recorded by flowmeters at the upgraded Mallow WwTP and new Bridge Street Pumping Station.
- Ensure the primary discharge is compliant with licensed ELVs.
- Monitor the effluent discharge and ambient water quality as per Schedule A: *Discharges & Discharge Monitoring*, and Schedule B: *Ambient Monitoring* of the WWDL.
- All workers attending the WwTP and Bridge Street Pumping Station will comply in full with the relevant HSE guidelines and any Government protocols that may be in place at that point in time in relation to COVID-19.

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20. ABBREVIATIONS

AER	Annual Environmental Report
AA	Appropriate Assessment
ACA	Architectural Conservation Area
AMIAQM	Associate Member of the Institute of Air Quality Management
AMIEnvSc	Associate Member of the Institution of Environmental Science
BOD	Biochemical Oxygen Demand
CO_2	Carbon Dioxide
CFB	Central Fisheries Board
CSO	Central Statistics Office
CIEEM	Chartered Institute of Ecology and Environmental Management
COD	Chemical Oxygen Demand
CA	Competent Authority
COMAH	Control of Major Accident Hazards
CJEU	Court of Justice of the European Union
DANI	Department of Agriculture for Northern Ireland
DCH&G	Department of Culture, Heritage and the Gaeltacht
DoEHLG	Department of Environment, Housing and Local Government
DHPLG	Department of Housing, Planning and Local Government
DWF	Dry Weather Flow
ERBD	Eastern River Basin District
EcIA	Ecological Impact Assessment
EQR	Ecological Quality Ratios
ED	Electoral Division
ESB	Electricity Supply Board
EO	Emergency Overflow
ELV	Emission Limit Value
ETS	Emissions Trading Scheme
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EQS	Environmental Quality Standards
EC	European Commission
EEC	European Economic Community

ESB	Electricity Supply Board
EU	European Union
FWPM/FWM	Freshwater Pearl Mussel
GIS	Geographic Information System
GSI	Geological Survey of Ireland
GHG	Greenhouse Gas
GWB	Ground Waterbody
GLVIA	Guidelines for Landscape and Visual Impact Assessment
HSE	Health Service Executive
IEL	Industrial Emission Licence
ICT	Information and Communications Technology
IFI	Inland Fisheries Ireland
IAI	Institute of Archaeologists of Ireland
IEMA	Institute of Environmental Management and Assessment
IGI	Institute of Geologists Ireland
ICM	Integrated Catchment Modelling
IPC	Integrated Pollution Control
IAH	International Association of Hydrogeologists
ICOMOS	International Council of Monuments and Places
ISO	International Organisation Standardisation
IAH	Irish Group of the Association of Hydrogeologists
IW	Irish Water
KER	Key Ecological Receptors
Km	Kilometre
kV	Kilovolt
LVIA	Landscape and Visual Impact Assessment
LCA	Landscape Character Area
LEA	Local Electoral Area
l/s	litres per second
MIEI	Member of Engineers Ireland
m^3/s	metres cubed per second
Mt CO_2eq	million tonnes carbon dioxide equivalent
NBAP	National Biodiversity Action Plan
NBDC	National Biodiversity Data Centre

NDP	National Development Plan
NGR	National Grid Reference
NPWS	National Parks and Wildlife Service
NPF	National Planning Framework
NRA	National Roads Authority
NIS	Natura Impact Statement
NOD	Nicholas O'Dwyer Limited
NO_2	Nitrogen Dioxide
OHSAS	Occupational Health and Safety Assessment Series
OU_e/m^3	Odour Units present in one meter cubed
OPW	Office of Public Works
OSI	Ordinance Survey Ireland
$PM_{2.5}$	Particulate Matter (<2.5 microns in diameter)
PM_{10}	Particulate Matter (<10 microns in diameter)
p.e.	Population Equivalent
pNHA	Proposed Natural Heritage Area
PWS	Public Water Supply
RSES	Regional Spatial and Economic Strategy
RBMP	River Basin Management Plan
RMP	River Management Plan
SWRBD	South Western River Basin District
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
S.I	Statutory Instrument
SPA	Special Protection Area
SWO	Storm Water Overflow
SCADA	Supervisory Control And Data Acquisition
SS	Suspended Solids
TII	Transport Infrastructure Ireland
UK	United Kingdom
UPM	Urban Pollution Management
UWWT	Urban Wastewater Treatment
UWWTD	Urban Wastewater Treatment Directive
WTP	Water Treatment Plant

WAC	Waste Assimilative Capacity
WWD	Waste Water Directive
WWDA	Waste Water Discharge Authorisation
WWDL	Waste Water Discharge Licence
WaPUG	Waste Water Planning Users Group
WwTP	Waste Water Treatment Plant
WwTW	Waste Water Treatment Works
WFD	Water Framework Directive
WSSP	Water Services Strategic Plan
WHO	World Health Organisation
ZoI	Zone of Influence

APPENDIX 1

CRITERIA FOR RATING SITE ATTRIBUTES – ESTIMATION OF IMPORTANCE OF HYDROLOGY ATTRIBUTES

TRANSPORT INFRASTRUCTURE IRELAND (TII, 2009)

EIAR Guideline tables for Hydrology

Table 1: Criteria for rating impact magnitude at EIS stage – Estimation of magnitude of impact on hydrology attributes (NRA, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and/ or quality and integrity of attribute	Loss or extensive change to a water body or water dependent habitat
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Calculated risk of serious pollution incident >1% annually2
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm1
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level1
Minor Beneficial	Results in minor improvement of attribute quality	Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually2
Moderate Beneficial	Results in moderate improvement of attribute quality	Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually2
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm1

Additional examples are provided in the NRA Guidance Document
1 Refer to Annex 1, Methods E and F, Annex 1 of HA216/06
1 Refer to Appendix B3 / Annex 1, Method D, Annex 1 of HA216/06

Source: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 2 Criteria for rating Site Attributes - Estimation of Importance of Hydrology Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation *e.g. 'European sites'* designated under the Habitats Regulations or '*Salmonid waters'* designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

APPENDIX 2

WASTE ASSIMILATIVE CAPACITY CALCULATIONS

NICHOLAS O'DWYER — Calculation Sheet

Project Number: 20893	Rev	Date	By	
Project Name: Mallow	1.0	07-Aug-22	CAS	
Sheet: 1 of 1	2.0	19-Oct-22	CAS	

Waste Assimilative Capacity (WAC) Calculation

Name of River	Blackwater (Munster)_140	WFD 2013-2018 Status & 2016-2021 Status	Good

River Flow	m³/s	Data Source	m³/d	PE	
				Treatment Plant Capacity (Design)	22,000
95%ile Flow	4.870	*EPA - Estimated 95%ile flow (up to 2018 data)*	420,768		

	Background Concentration		Current Effluent Standards as per D0052-01 (Tech A) [Note 2]	Max Allowable D/S (mg/l)		
	mg/l	Data Source	(mg/l)	Good Status [Note 1]	High Status [Note 1]	EQS [Note 1]
Carbonaceous BOD	1.207	*Data Source: Catchments.ie (Station RS18B021600 - Mean Data from Jan 2020 – July 2022)*	25.00	2.60	2.20	95%ile EQS Status
Total Ammonia (NH_3)	0.047		3.00	0.14	0.09	95%ile EQS Status
Ortho-Phosphate (OP)	0.031		1.00	0.075	0.045	95%ile EQS Status

Dry Weather Flow	Flow in River	Allowable Effluent Concentration	WAC	Predicted Downstream Concentration	Comments	Legislation
m³/d	95%ile m³/d	BOD mg/l	BOD kg/d	BOD mg/l	Treatment Plant Capacity	Comply with SW Regulations
5435	420,768	110.47	600.40	1.510	22,000 p.e	Yes
m³/d	95%ile m³/d	NH_3 mg/l	NH_3 kg/d	NH_3 mg/l		
5435	420,768	7.31	39.73	0.085	22,000 p.e	Yes
m³/d	95%ile m³/d	OP mg/l	OP kg/d	OP mg/l		
5435	420,768	3.44	18.72	0.044	22,000 p.e	Yes

Note 1: S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Note 2: More onerous Ortho-P ELV to that cited in D0052-01 required in order to meet High Status EQS.

NICHOLAS O'DWYER — Calculation Sheet

Project Number: 20893		Rev	Date	By	
Project Name: Mallow		1.0	07-Aug-22	CAS	
Sheet: 1 of 1		2.0	19-Oct-22	CAS	

Waste Assimilative Capacity (WAC) Calculation

Name of River	Blackwater (Munster)_140	WFD 2013-2018 Status & 2016-2021 Status	Good

River Flow	m³/s	Data Source	m³/d	PE: Treatment Plant Capacity (Design)	22,000
95%ile Flow	4.870	*EPA - Estimated 95%ile flow (up to 2018 data)*	420,768		

Background Concentration			Current Effluent Standards as per D0052-01 (Tech A) Note 2	Max Allowable D/S (mg/l)		
	mg/l	Data Source	(mg/l)	Good Status Note 1	High Status Note 1	EQS Note 1
Carbonaceous BOD	0.260	Background Concentration mg/l (Notionally Clean)	25.00	2.60	2.20	95%ile EQS Status
Total Ammonia (NH_3)	0.008		3.00	0.14	0.09	95%ile EQS Status
Ortho-Phosphate (OP)	0.005		1.00	0.075	0.045	95%ile EQS Status

Dry Weather Flow	Flow in River	Allowable Effluent Concentration	WAC	Predicted Downstream Concentration	Comments	Legislation
m³/d	95%ile m³/d	BOD mg/l	BOD kg/d	BOD mg/l	Treatment Plant Capacity	Comply with SW Regulations
5435	420,768	183.76	998.73	0.575	22,000 p.e	Yes
m³/d	95%ile m³/d	NH_3 mg/l	NH_3 kg/d	NH_3 mg/l		
5435	420,768	10.36	56.30	0.046	22,000 p.e	Yes
m³/d	95%ile m³/d	OP mg/l	OP kg/d	OP mg/l		
5435	420,768	5.49	29.86	0.018	22,000 p.e	Yes

Note 1: S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Note 2: More onerous Ortho-P ELV to that cited in D0052-01 required in order to meet High Status EQS.

APPENDIX 3

WATER FRAMEWORK DIRECTIVE SCREENING ASSESSMENT

WATER FRAMEWORK DIRECTIVE (WFD) SCREENING ASSESSMENT

FOR THE MALLOW AGGLOMERATION OPERATIONAL DISCHARGES

AT

MALLOW, CO. CORK

Report Prepared For

Nicholas O'Dwyer

Report Prepared By

Colm Driver BSc MSc PGeo EurGeol,
Senior Hydrogeologist

Our Reference

CD/227501.0530WR01

Date of Issue

09th November 2022

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Signature		
Name	Colm Driver	Teri Hayes
Title	Environmental Consultant	Director
Date	9th November 2022	9th November 2022

Contents

1.0 INTRODUCTION

AWN Consulting Limited (AWN) were retained by Nicholas O'Dwyer Ltd., on behalf of Irish Water (IW), to prepare this Water Framework Directive (WFD) Screening Assessment as part of the Environmental Impact Assessment Report (EIAR) for the operational discharges associated with the Mallow Waste Water Discharge Licence Review Application. A detailed description of the operational discharges (SW001 and SW010) is provided in **Chapter 3** of the EIAR.

This WFD Screening Assessment has been prepared in response to the requirements of the WFD. This WFD Screening Assessment is contained as an Appendix to the EIAR and specifically to supplement the Land, Soils, Geology & Hydrogeology Chapter and Water Chapter of the EIAR and should, therefore, be read together with these chapters.

This report was prepared by Colm Driver (BSc MSc PGeo EurGeol), and Teri Hayes (BSc MSc PGeol EurGeol). Colm is a Senior Hydrogeologist with over 5 years of experience in environmental consultancy and water resources studies. Colm is a professional member of the Institute of Geologists Ireland and European Federation of Geologists). He is also an active member of the Irish Group of the Association of Hydrogeologists (IAH).

Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is a professional member of the Institute of Geologists Ireland and European Federation of Geologists and has qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment, and environmental impact assessment.

1.1 Background

The Mallow agglomeration (D0052-01) is currently served by a sewerage system which comprises mainly combined sewers in the Town Centre area, with separated foul and storm drainage in newer developments on the outskirts of the town. A number of streets in the town have separate surface water sewers which discharge to local streams or to the River Blackwater.

The existing sewer network in Mallow contains a number of Storm Water Overflows (SWOs) which frequently discharge untreated wastewater to the River Blackwater in the absence of any stormwater storage. The existing network is also insufficient to comply with Irish Water's design criterion for no flooding from the network in a 1:20 year return period storm event.

Mallow Waste Water Treatment Plant (WwTP) at Ballyellis, Mallow, has a current operational plant capacity of 10,500 population equivalent (p.e.). It should be noted that there are two process streams at the plant, however only 1 no. process stream is currently operational in recent years as major Capital Maintenance works are required to bring the second process stream back into operation in order to restore the operational capacity to the original design capacity of 18,000 p.e. In its' current configuration and setup, the plant is currently organically overloaded and cannot cater for the existing loads (current collected load (peak week) *ca.* 14,648 p.e. (2021 AER)).

Mallow agglomeration is currently in breach of Articles 3, 4(1), 5(1) and 12 of the Urban Wastewater Treatment Directive (UWWTD) (91/271/EEC) and as such is the subject of an infringement notice from the European Court of Justice (ECJ).

Irish Water's Water Services Strategic Plan (WSSP) includes an objective to target capital investment to progressively achieve compliance with UWWTD and the Water Framework Directive (WFD).

In April 2019, Irish Water applied to Cork County Council Planning Authority under Section 34 of the Planning and Development Act, 2000 (as amended) for the Mallow Sewerage Scheme Upgrade Project (Ref. Planning Register Number: 195078). A final grant of planning was obtained on the 13th January 2020, subject to 41 no. conditions.

The main objectives of the Mallow Sewerage Scheme Upgrade Project are to ensure compliance with the WWDL - Licence Register Number: D0052-01; issued by the EPA in accordance with the Waste Water Discharge (Authorisation) Regulations (S.I. No. 684 of 2007) on the 18th December 2012 (now S.I. No. 214 of 2020), and subsequent Technical Amendments A and B, and to ensure compliance with Irish Water's Water Services Strategic Plan (WSSP) which includes an objective to target capital investment to progressively achieve compliance with the UWWTD and the Water Framework Directive (WFD).

The Upgrade Project consists of 2 no. contracts, namely the Networks Upgrade Contract which commenced on site in April 2021, and which has an estimated completion date of January 2023 and the Mallow WwTP Upgrade and new Bridge Street Pumping Station Contract, which commenced in May 2021, and which has an estimated completion date of December 2023.

The Upgrade Works includes for the removal of 9 no. Storm Water Overflows (SWO), laying of new sewers, provision of a new pumping station to replace the existing Mallow Bridge Pumping Station at Bearforest Lower and the upgrading of the existing WwTP.

Planning was obtained on the basis of WwTP meeting the ELV's as per Schedule A.1. of the WWDL DL0052-01: BOD 25mg/l, COD 125mg/l, SS 25mg/l, pH 6-9 pH units, Total Phosphorous 2mg/l, Ammonia 3mg/l and Orthophosphate 1.5mg/l.

Since planning was obtained, a Waste Assimilative Capacity calculation was completed in 2022 to inform this WWDA review application in order to ensure that the above ELVs were fit for purpose based on the latest data available (see **Appendix B** of EIAR). It was concluded that a more onerous Ortho-phosphate ELV of 1mg/l was required in order to meet the High-status 95%ile EQS downstream of the primary discharge.

The most significant drainage system in the vicinity is the Blackwater (Munster) River and its tributaries (refer to **Figure 1.1**, below) which is located along the northern boundary of the Mallow WwTP.

The operational discharges subject to the licence review are located within the former South Western River Basin District (SWRBD) (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 18 (Blackwater (Munster)) of the Irish River Network.

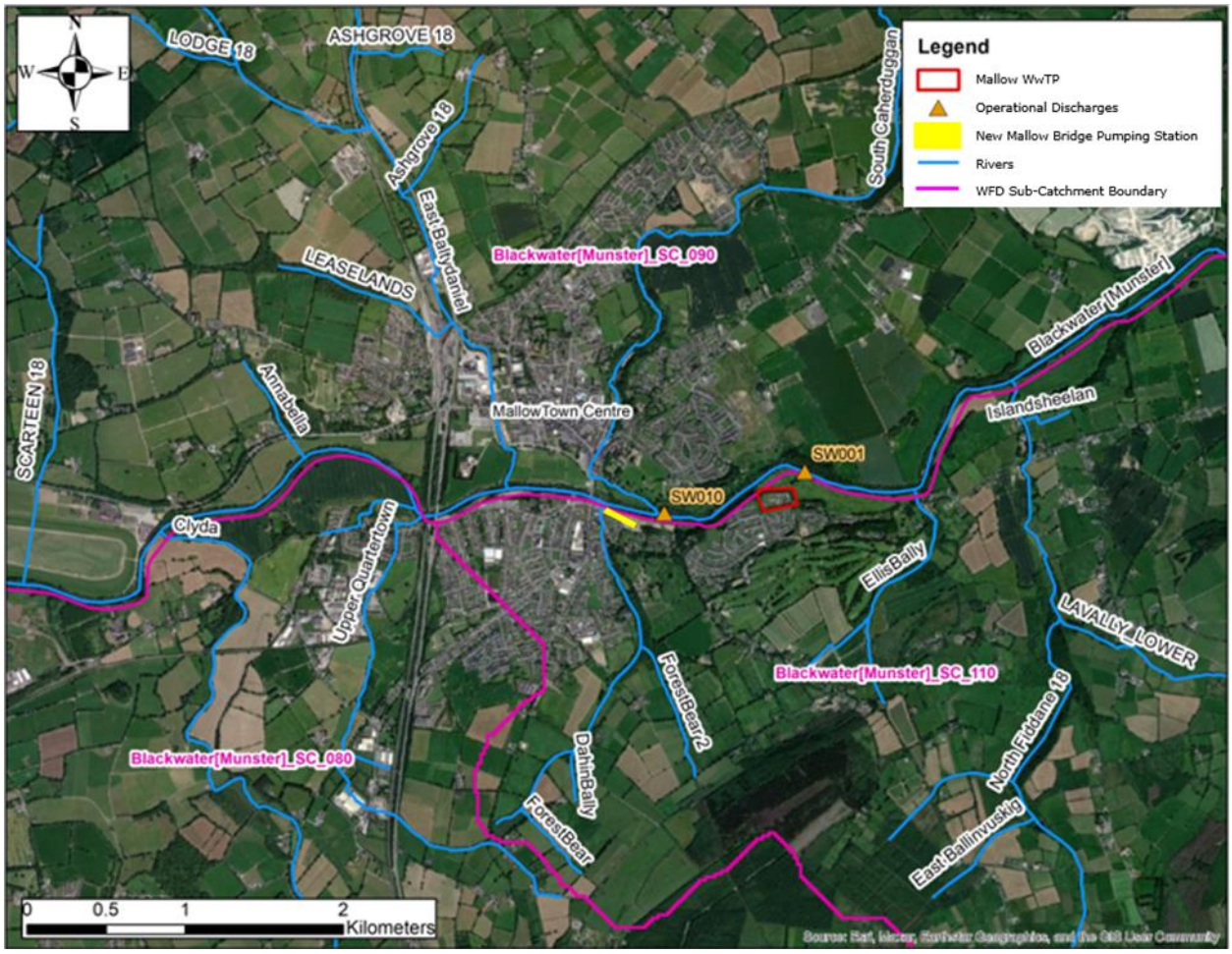

Figure 1.1 Site Location Map with hydrological environment

1.2 Legislative Context

The Water Framework Directive (WFD) 2000/60/EC aims to protect and enhance the quality of the water environment (both surface water and groundwater) across all European Union member states. It takes a holistic approach to the sustainable management of water by considering the interactions between surface (including transitional and coastal waters, rivers, streams, and lakes), groundwater and water dependent ecosystems.

Under the WFD, '*water bodies'* are the basic management units and are defined as all or part of a river system or aquifer. These water bodies form part of a larger river basin district (RBD), for which '*River Basin Management Plans'* (RBMP) are developed by EU member states and environmental objectives are set. RBMPs are produced every six (6) years, in accordance with the river basin management planning cycle.

The WFD requires all EU member states to classify the current condition or '*status or potential'* of surface and groundwater bodies and to set a series of objectives for maintaining or improving conditions so that water bodies maintain or reach 'good status or potential' during the next river basin management planning cycle. EPA and other stakeholders such as local authorities are the competent authority for implementing the WFD in Ireland. Article 4(1) of the WFD states "*to ensure non-deterioration and the achievement of good surface water status*":

- Surface waters: Good chemical and Good Ecological status/potentials
- Groundwater: Good Chemical and Good Quantitative status.

As part of its role, these authorities must consider whether proposals for new developments (other than where exemptions apply Article 4.4 - 4.7) have the potential to:

- Cause a deterioration of a water body from its current status or potential; and/ or
- Prevent future attainment of good status or potential where not already achieved.

As a result, new developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

The requirement to demonstrate compliance with the Article 4(1) test for "*no deterioration*" by a development was upheld by the High Court in the Sweetman v An Bord Pleanala (2021 IEHC 16) "*Bradan Beo case*". The court relied on the *Weser judgement in terms of interpretation of Article 4. In that case, the CJEU concluded that:*

Article 4 required that Member states were required to refuse authorisation for a project (other than where exemptions apply) where it may cause deterioration of the status of a body or water or where it jeopardises the attainment of good water status.

- *"deterioration of the status" of the relevant water body includes a fall by one class of any element of the "quality elements" even if the fall does not result in the a fall of the classification of the water body as a whole;*

- *'Any deterioration' in quality elements in the lowest class constitutes deterioration; and*

- *Certainty regarding a project's compliance with the Directive is required at the planning consent stage; hence, where deterioration 'may' be caused, derogations under Article 4.7 of the WFD are required at this stage.*

While deterioration within a status class does not contravene the requirements of the WFD, (except for Drinking Water Directive parameters in drinking water protected areas), the WFD requires that action should be taken to limit within-class deterioration as far as practicable. For groundwater quality, measures must also be taken to reverse any environmentally significant deteriorating trend, whether or not it affects status or potential.

The *no deterioration* requirements are applied independently to each of the elements that come together to form the water body classification as required by Annex V of the Water Framework Directive and Article 4 of the Groundwater Daughter Directive.

The WFD requires *'Good Water Status'* for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. In 2009 the SWRBD River Management Plan (RMP) 2009-2015 was published. In the SWRBD RMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (*e.g.* water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD by 2015 and include a programme of measures to address and alleviate these pressures by 2015. This was the first River Basin Management planning cycle (2010-2015). The second cycle river basin management plan for Ireland is currently in place and will run between 2018-2022 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD).

The primary aim of the plan is that Water bodies identified as being '*At Risk'* of not achieving their environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. 190 Areas for Action were identified across the 5 Local Authority regions. Within these 190 areas, a total of 726 water bodies were selected for initial actions during this RBMP cycle. There are 832 water bodies identified as being '*At Risk'* of not achieving their environmental objectives under this Plan that have not been included in the Areas for Action. For most of these water bodies, targeted actions will be undertaken in the third cycle RBMP from 2022-2027. The draft 3rd cycle RBMP has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the proposed development.

1.3 Sources of Information

The following sources of information were used:

- Geological Survey of Ireland- online mapping (GSI, 2022).
- GSI - Geological Heritage Sites & Sites of Special Scientific Interest
- Ordnance Survey of Ireland (OSI).
- Teagasc subsoil database.
- National Parks and Wildlife services (NPWS, 2022),
- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area.
- River Basin Management Plan for Ireland 2018-2021.
- *Draft* River Basin Management Plan for Ireland 2022-2027.
- Cork County Development Plan 2022-2028.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW)).
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council.
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001).
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

2.0 WATER FRAMEWORK DIRECTIVE (WFD) SCREENING

According to the EPA maps, the Mallow agglomeration operational discharges (SW001 and SW010) are located within the former SWRBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 18 (Blackwater (Munster)) of the Irish River Network. It is located within the Blackwater (Munster) WFD Catchment and Blackwater Sub-Catchments (Blackwater[Munster]_SC_090, 18_21 & Blackwater[Munster]_SC_110, 18_4).

The Groundwater Body (GWB) underlying the site is the Mitchelstown GWB (EU Groundwater Body Code: IE_SW_G_082). Refer to **Section 3.6** below for further information.

This WFD Screening has identified one (1) no. WFD surface water bodies and one (1) no. WFD groundwater bodies of relevance due to the close proximity and connection of these waterbodies during the operation of the proposed development. To note there is a direct connection to the Blackwater waterbody during the operation as the primary discharge (SW001) discharges to this waterbody.

The waterbodies are listed in **Table 2-1** and the locations are presented in **Figure 1.1** above. For each the most recent WFD status and risk score is provided (source EPA website - EPA Maps)

Table 2-1 *WFD water bodies located within the study area*

Type	WFD Classification	WFD Status (2013-2018)	WFD Risk (2013-2018)	Waterbody Name / ID	Location
Surface Water	River	*Good**	*Not At Risk*	Blackwater (Munster) (IE_SW_18B021720)	Located along the northern boundary of the Mallow WwTP.
Groundwater	Groundwater	*Poor**	*At Risk*	Mitchelstown Groundwater Body (GWB) (IE_SW_G_082)	Groundwater body immediately underlying the proposed development site.

***** *Also Good Status for the recently published 2016-2021 monitoring period*

It is proposed that the operational discharge will discharge to the Blackwater (Munster)_140, refer to **Section 3.4** below. To note, there are no discharges to ground, or abstractions associated with the Mallow Agglomeration.

With consideration of the operational discharges from the Mallow agglomeration and taking into account the techniques embedded within the design of the Mallow Sewerage Scheme Upgrade Project (as detailed in **Chapter 6** Water of the EIAR) it is considered that all WFD water bodies identified in **Table 2-1** should be carried through into the WFD Assessment.

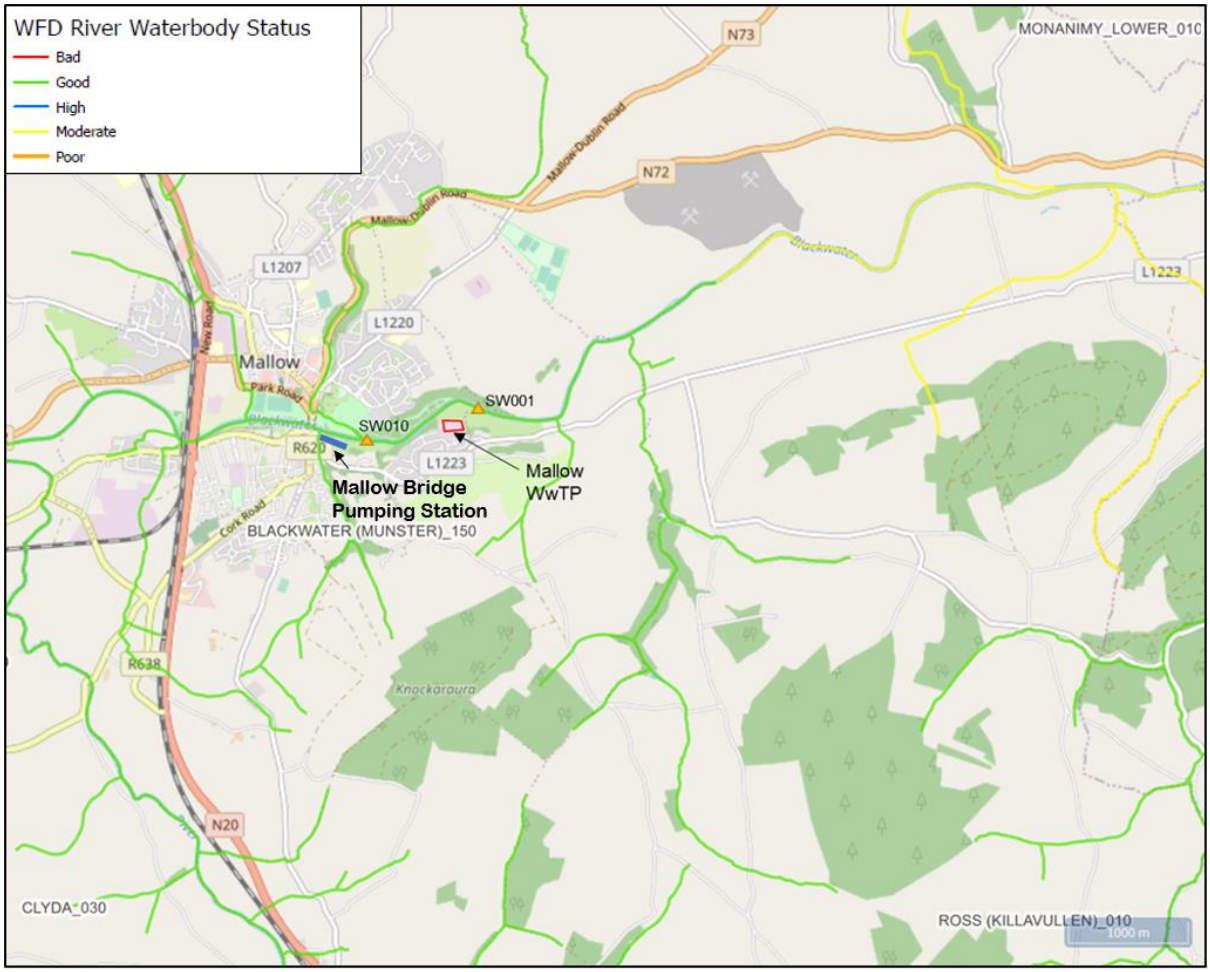

Figure 2.1 *WFD status for the local hydrological environment*

3.0 EXISTING ENVIRONMENT – WATER BODY STATUS

3.1 Topography

The topography is generally consistent and flat across the Mallow WwTP and Bridge Street Pumping Station sites (approximately +12 mAOD). The most significant drainage system in the vicinity is the Blackwater (Munster) River and its tributaries, which are located directly north of the WwTP and the Pumping Station sites (refer to **Figure 1.1**, above).

3.2 Land Use

The Mallow agglomeration (D0052-01) is currently served by a sewerage system which comprises mainly combined sewers in the Town Centre area, with separated foul and storm drainage in newer developments on the outskirts of the town. A number of streets in the town have separate surface water sewers which discharge to local streams or to the River Blackwater.

3.3 Water Body Status

3.3.1 Background to Surface Water Body Status

Under the WFD, surface water body status is classified on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and considered by the EPA not to have been significantly modified for anthropogenic purposes (*i.e.,* culverting). Ecological potential is assigned to artificial and man-made water bodies (such as canals), or natural water bodies that have undergone significant modification. The term '*ecological potential'* is used as it may be impossible to achieve Good Ecological Status because of modification for a specific use, such as navigation or flood protection. The ecological potential represents the degree to which the quality of the water body approaches the maximum it could achieve. The worst-case classification is assigned as the overall surface water body status, in a '*one-out all-out'* system. This system is summarised below in **Figure 3-1**.

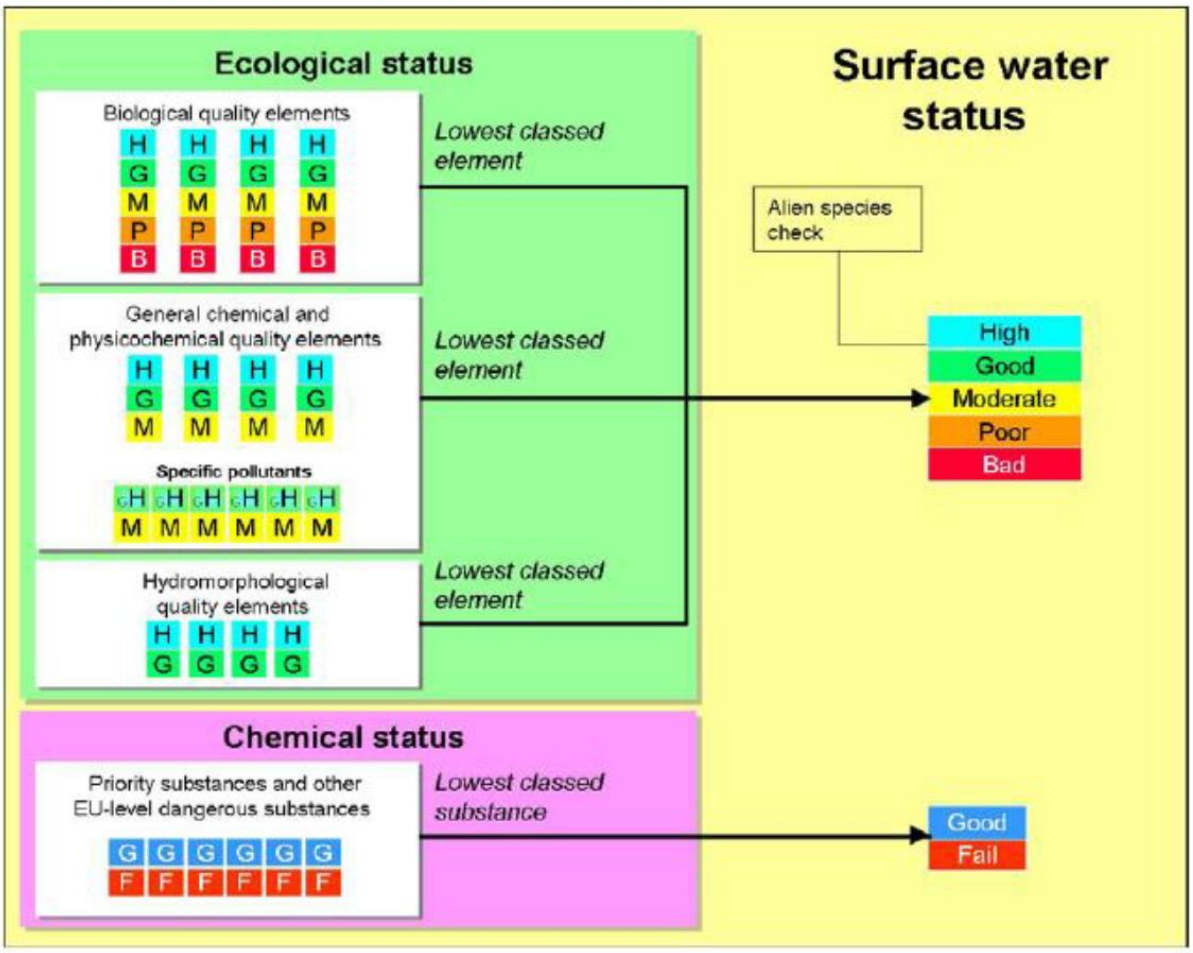

Figure 3.1 *WFD classification elements for surface water body status (Environmental Agency, 2015)*

3.3.2 Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC). This is assigned on a scale of good or fail. Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being at good chemical status.

3.3.3 Ecological Status

Ecological status or potential is defined by the overall health or condition of the watercourse. This is assigned on a scale of High, Good, Moderate, Poor or Bad, and on the basis of four classification elements or '*tests'*, as follows:

- **Biological:** This test is designed to assess the status indicated by a biological quality element such as the abundance of fish, invertebrates or algae and by the presence of invasive species. The biological quality elements can influence an overall water body status from Bad through to High.
- **Physico-chemical:** This test is designed to assess compliance with environmental standards for supporting physicochemical conditions, such as dissolved oxygen, phosphorus and ammonia. The physicochemical elements can only influence an overall water body status from Moderate through to High.
- **Specific pollutants:** This test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc,

cypermethrin or arsenic. As with the physico-chemical test, the specific pollutant assessment can only influence an overall water body status from Moderate through to High.

- **Hydromorphology:** For natural, this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High status. It specifically assesses elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological elements do not support High status, then the status of the water body is limited to Good overall status. For artificial or highly modified waterbodies, hydromorphological elements are assessed initially to determine which of the biological and physico-chemical elements should be used in the classification of ecological potential. In all cases, assessment of baseline hydromorphological conditions are an important factor in determining possible reasons for classifying biological and physicochemical elements of a water body as less than Good, and hence in determining what mitigation measures may be required to address these failing water bodies.

3.4 Surface Water Quality

Hydrological Environment

The upgraded WwTP Primary Discharge (SW001) and the new Dual Function Overflow from the new Bridge Street Pumping Station will discharge to the Blackwater (Munster)_140. The Mallow WwTP currently operates under the D0052-01 licence.

The operational discharges are located within the former SWRBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 18 (Blackwater (Munster)) of the Irish River Network. It is located within the Blackwater (Munster) WFD Catchment and Blackwater Sub-Catchments (Blackwater[Munster]_SC_090, 18_21 & Blackwater[Munster]_SC_110, 18_4).

Surface Water Quality

Figure 3.2 below presents the EPA quality monitoring points in the context of the operational discharges and other regional drainage settings.

Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the operational discharges setting, the nearest EPA monitoring station is situated along the Blackwater (Munster) River. The EPA assesses the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

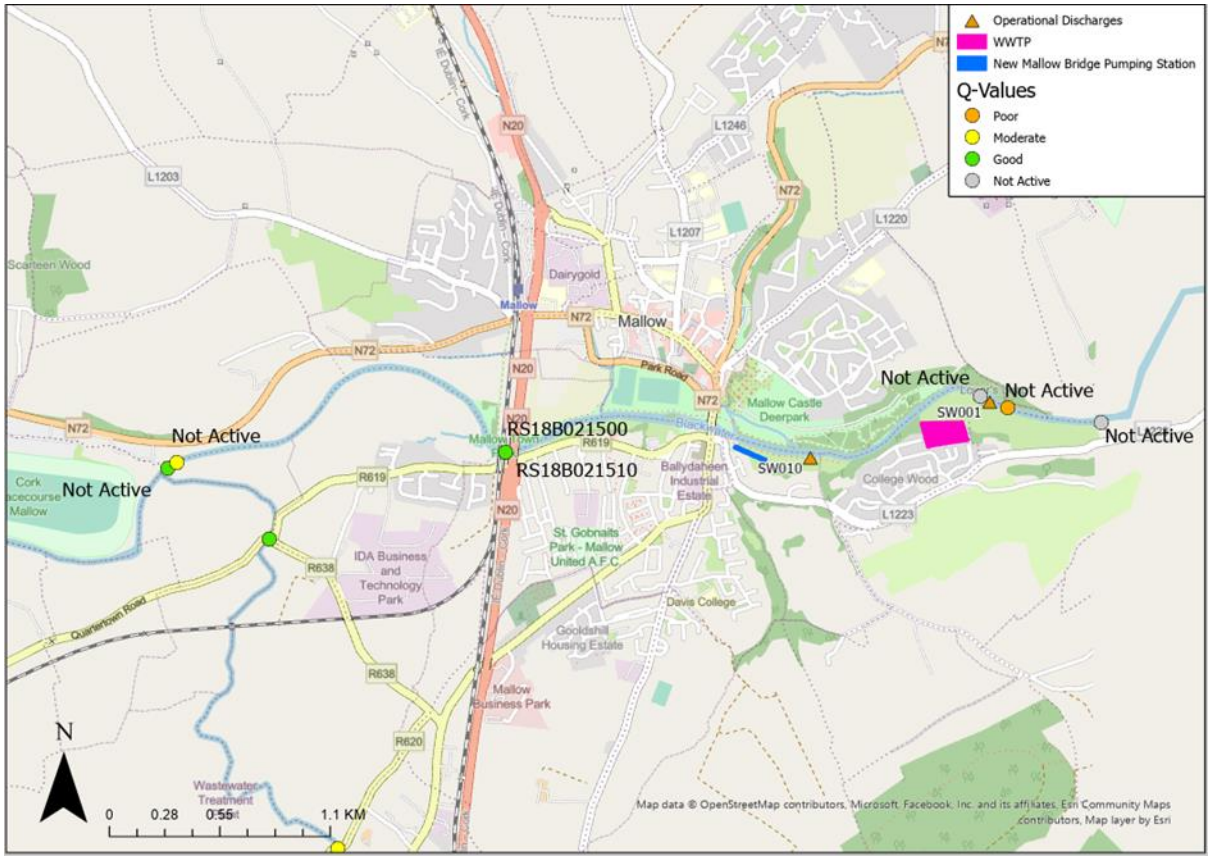

Figure 3.2 Surface Water Quality Monitoring Point (EPA,2022)

There are three (3) no. water quality monitoring stations located along the Blackwater River upstream and downstream of the Mallow Wastewater Treatment Plant (WwTP) which have quality ratings available within the last ten years. The first of these (Rly Bridge, Mallow (LHS) RS18B021500) obtained a Q4 – Good Status (in 2021), the second station (Rly Bridge, Mallow (RHS), RS18B021510) was Q3-4 – Moderate Status at last measurement (2021) and the third station is downstream of the Mallow WwTP (North-east of Ballymagooly, RS18B021800) obtained a Q4 – Good Status in 2020.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. Currently, the EPA classifies the WFD Ecological Status for the Blackwater (Munster)_140 waterbody (IE_SW_18B021720) as having '*Good Status'* (2013-2018 and 2016-2021) with a current WFD River Waterbody risk score of *Not At Risk of Not Achieving Good Status.* Furthermore, the Blackwater (Munster) (IE_SW_18B021900) waterbody changes status to *Moderate* approximately 2.30 km downstream from SW001 discharge point.

Figure 3.3 presents the operational discharge points as they relate to the WWDL review, *i.e.*, SW001 and SW010, and **Figure 2.1** above presents the WFD status of the local hydrological environment

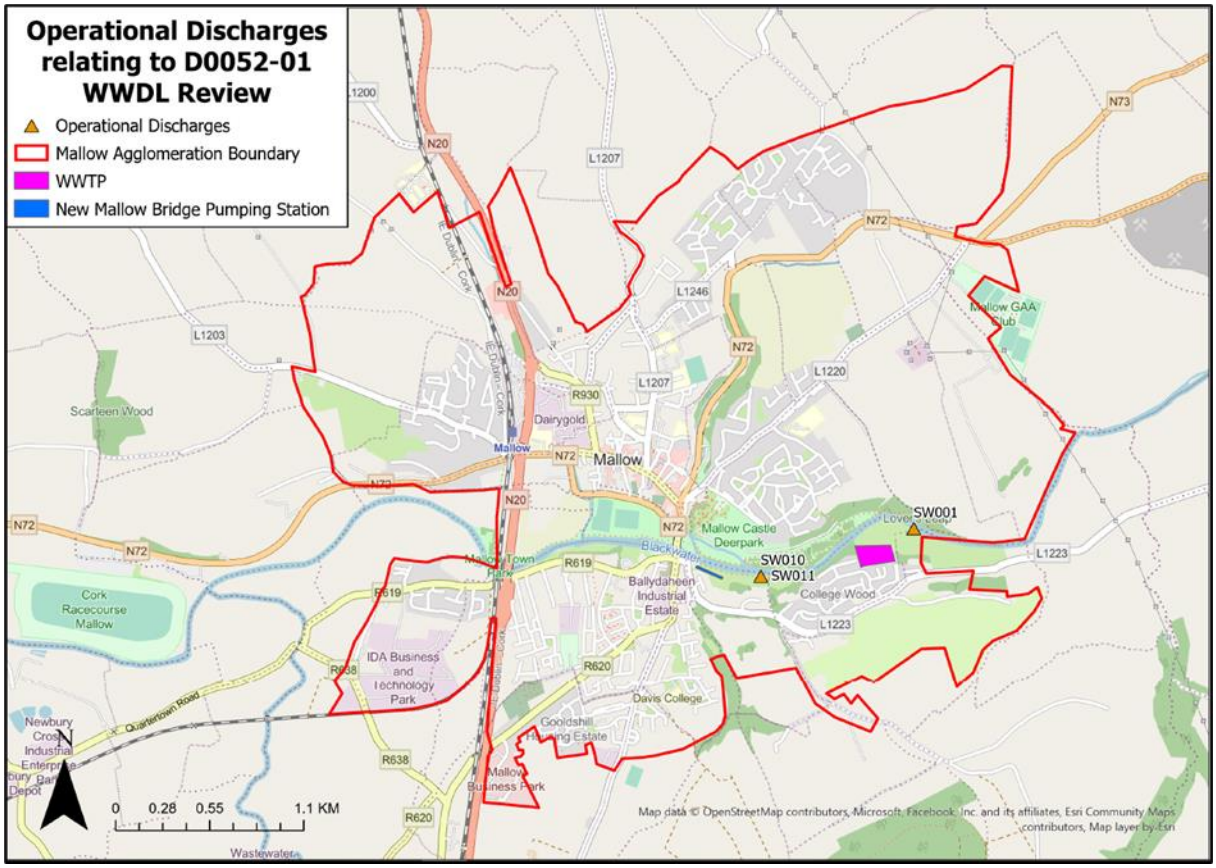

Figure 3.3 *Operational Discharges Relating To D0052-01 WWDL Review and WFD Status Of The Surrounding Waterbodies*

As a whole, the Blackwater (Munster) Subcatchment (Blackwater[Munster]_SC_110) is considered to have an ecological status of *Good Status*. This is based on current monitoring carried out at this catchment level along the Blackwater (Munster) River refer to **Figure 3.4** below.

SW 2013-2018

Status	Assessment Technique	Status Confidence	Value	
▾ Ecological Status or Potential	Grouping	low confidence	Good	
Supporting Chemistry Conditions			Pass	
General Conditions			Pass	
Oxygenation Conditions			Pass	
Dissolved Oxygen (% Sat)			Pass	
Other determinand for oxygenation conditions			High	
Acidification Conditions			Pass	
pH			Pass	
Nutrient Conditions			Pass	
Nitrogen Conditions			Good	
Nitrate			Good	
Ammonium			High	
Phosphorous Conditions			High	
Orthophosphate			High	

Figure 3.4 *Surface Water Quality for the waterbody, EPA, 2022.*

The current WFD status of the Blackwater (Munster)_140 is classed as *Good* status. As can be seen on **Figure 3.4** above, for 2013-2018 assessment period, both Ammonium and Ortho-phosphate are noted as High under WFD status.

Despite a reduction in the number of waterbodies impacted, excess nutrients remain the most prevalent issue in the Blackwater (Munster) Catchment impacting 34 waterbodies in Cycle 3. Morphological issues are impacting 18 waterbodies, organic pollution is impacting 13, hydrological impacts are affecting 11, sediment issues are impacting nine and chemical pollution is impacting one groundwater body (Glenville). There are also 11 At Risk waterbodies where the impact type falls under the other category.

- For rivers, the main significant issues are nutrient pollution (25), morphological issues (18), hydrological issues (11), organic pollution (11), sediment (9) and unknown impacts (4).
- The only At Risk transitional waterbody (Lower Blackwater M Estuary / Youghal Harbour) is impacted by nutrient and organic pollution.
- The only At Risk coastal waterbody (Youghal Bay) is impacted by nutrient and organic pollution.
- Nutrient pollution is the issue in seven of the eight At Risk groundwater and the impact in the remaining waterbody bodies Glenville is chemical pollution. There are additional impacts types attributed to seven of these groundwater body mainly unknown impact type or diminution of quality of associated surface waters for chemical reasons.

Agriculture is a significant pressure in 19 river waterbodies, one transitional waterbody (Lower Blackwater M Estuary / Youghal Harbour), one coastal waterbody (Youghal Bay) and seven groundwater bodies in Cycle 3. Phosphorus loss to surface waters from, for example, direct discharges; or runoff from yards, roadways or other compacted surfaces, or runoff from poorly draining soils remains an issue since Cycle 2. High nitrates concentrations have been identified mainly in waterbodies across the catchment in Cycle 3, which has contributed to an increase in the number of waterbodies impacted by nutrient pollution from agricultural sources. Sediment can also be a problem from land drainage works, bank erosion from animal access or stream crossings (Blackwater (Munster) (catchments.ie)).

This sub-catchment (Blackwater (Munster)_SC_090) comprises a portion of the Blackwater main channel (Blackwater (Munster)_100 to Blackwater (Munster)_160). The issues on the main channel range from the decline of a *High-status* objective water body (Blackwater (Munster)_110) to *Good*, which was driven by hydromorphology pressures, to a combination of point (IPC facility) and urban diffuse sources on Blackwater (Munster)_130 (Subcatchment Assessment (catchments.ie)).

The issues on the main channel range from elevated nutrients due to a combination of point (licenced facility) and urban diffuse sources on Blackwater (Munster)_130 to unknown pressures driving moderate fish status on Blackwater (Munster)_160.

3.4.1 Mallow Agglomeration Operational Discharges

Primary Discharge – SW001

The primary discharge from Mallow WwTP discharges to the River Blackwater at NGR 157530E 098140N *via* the primary discharge outfall SW001.

Planning was obtained on the basis of WwTP meeting the ELV's as per Schedule A.1. of the WWDL DL0052-01: BOD 25mg/l, COD 125mg/l, SS 25mg/l, pH 6-9 pH units, Total Phosphorous 2mg/l, Ammonia 3mg/l and Orthophosphate 1.5mg/l. Since planning was obtained, a Waste Assimilative Capacity calculation was completed in 2022 to inform this WWDA review application in order to ensure that the above ELVs were fit for purpose based on the latest data available (see **Appendix 3** of the EIAR). It was concluded that a more onerous Ortho-phosphate ELV of 1mg/l was required in order to meet the High-status 95%ile EQS downstream of the primary discharge. The primary discharge will comply with the proposed ELVs/standards as set out in **Table 3.1** below.

The WAC calculation based on the proposed ELVs at 22,000 p.e shows that the receiving waterbody has the capacity to accommodate the proposed discharge from the upgraded WwTP without causing a breach in the relevant standards as outlined in National and European legislation. This includes ensuring compliance with the *Good* and *High* (95%ile EQSs) standards set in European Communities Environmental Objectives (Surface Water) Regulations, 2009, as amended.

All flows arriving at the upgraded WwTP will receive secondary treatment with Phosphorus and Nitrogen removal in order to comply with the proposed ELVs tabled below.

Table 3.1 Proposed Emission Limit Values (ELVs) for Upgrade Mallow WwTP

Parameter	Proposed ELVs
Biological Oxygen Demand	25 mg/l
Chemical Oxygen Demand	125 mg/l
Suspended Solids	25 mg/l
Ortho-Phosphate (as P)	1 mg/l
Total Phosphorous (as P)	2 mg/l
Ammonia (as N)	3 mg/l
pH	6 - 9

These standards give effect to the principle of the Combined Approach as defined in Waste Water Discharge (Authorisation) Regulations, 2007 to 2020 in that they accommodate the Urban Waste Water Regulations, and the status of the receiving waterbody, the Blackwater River.

The Mallow Sewerage Scheme Upgrade Project has been designed to ensure that emissions from the works will not result in the contravention of any relevant EU Directives and National Regulations.

SW010 – Dual Function Overflow from Bridge Street Pumping Station

There will be one Dual Function Overflow (SW010) at the Bridge Street Pumping Station *i.e.*, an overflow which can act as a Storm Water Overflow (SWO) or as an Emergency Overflow (EO) depending on the event.

SWO

In the event that the storm water tank is at capacity an overflow from the storm tank will be discharged to the River Blackwater *via* a new SWO (SW010 – NGR 156636E, 097862N). Level probes will control the flow in and out of the storm tank. This high-level overflow will be capable of conveying the full storm flow of 3,500 l/s and shall not permit backflow from the storm tank to the storm sump. Overflows to the storm water storage tank will be screened *via* a self-cleaning mechanical screen with a maximum passage of 6mm.

The Storm Water Overflow has been designed to meet definition of '*Storm Water Overflow*' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995.

EO

A standby power generator will be present at the new Bridge Street Pumping Station to provide for continued operation of the pumping station in the event of an interruption in the power supply. If there was a "*catastrophic failure*" whereby there was a power failure and the backup generator was to fail then flows would enter the stormwater storage tank until it reaches its capacity and will then be discharged to the Blackwater River *via* an Emergency Overflow (SW010) at NGR 156636E, 097862N.

3.5 Background to Groundwater Body Status

Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. Status is assessed primarily using data collected from the EPA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread/ diffuse pollution. The worst-case classification is assigned as the overall groundwater body status, in a '*one-out all-out'* system. This system is summarised in **Figure 3.6** below.

3.5.1 Quantitative Status

Quantitative status is defined by the quantity of groundwater available as baseflow to watercourses and water-dependent ecosystems, and as 'resource' available for use as drinking water and other consumptive purposes. This is assigned on a scale of Good or Poor, and on the basis of four classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to "significant damage" to associated GWDTEs (with respect to water quantity).
- **Water balance:** This test is designed to identify groundwater bodies where groundwater abstraction exceeds the "available groundwater resource", defined as the rate of overall recharge to the groundwater body itself, as well as the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTEs.

3.5.2 Chemical Status

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of Good or Poor, and on the basis of five classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the chemical status of associated surface water bodies.
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to "significant damage" to associated GWDTE's (with respect to water quality).
- **Drinking Water Protected Areas (DrWPAs):** This test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.
- **General quality assessment:** This test is designed to identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.

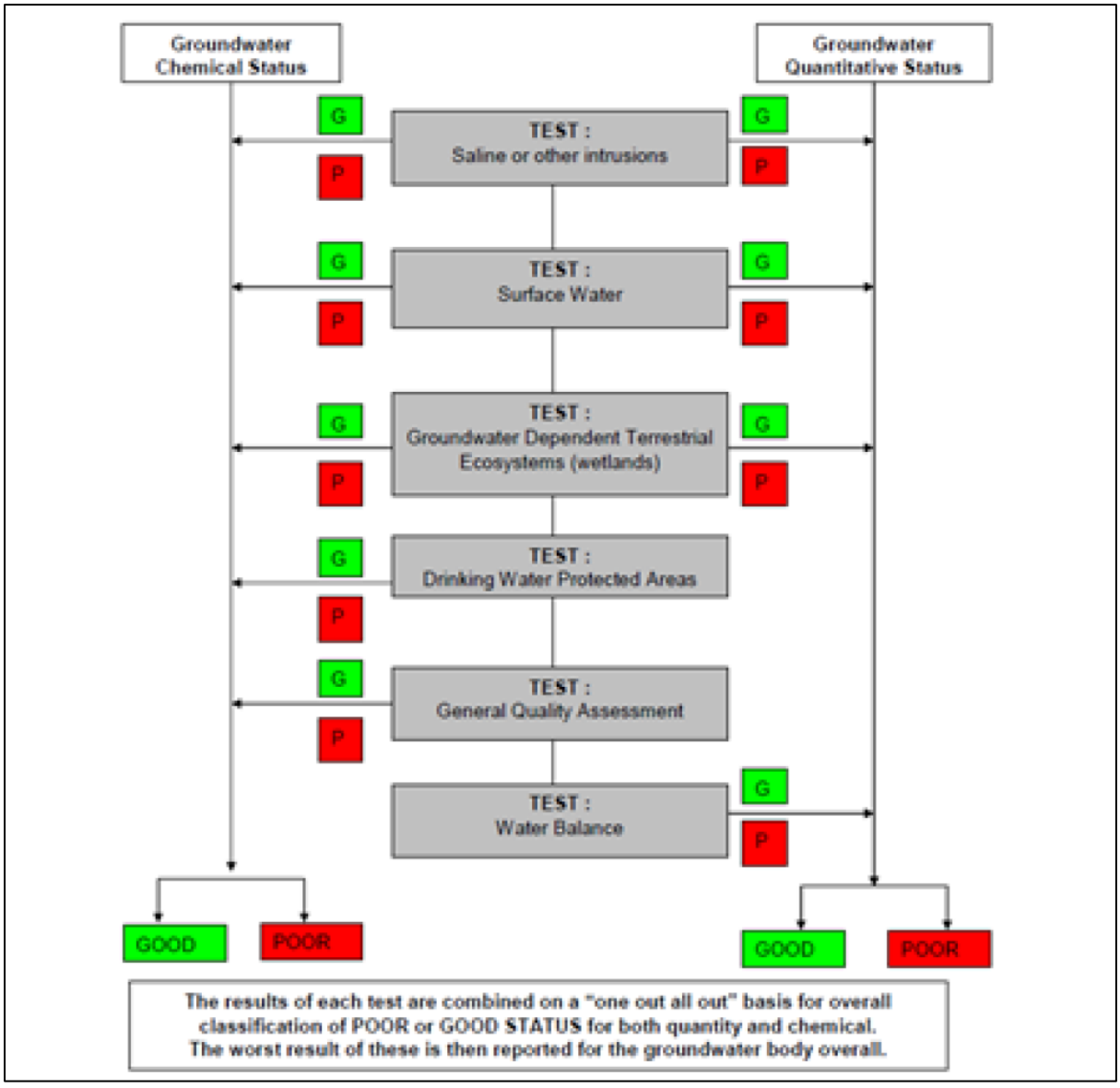

Figure 3.6 *WFD classification elements for groundwater body status (Environmental Agency, 2015)*

3.6 Groundwater Water Status

Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater throughput (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The bedrock aquifer underlying the site according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map is classified as a (*Rkd*) *Regionally Important Aquifer - Karstified (diffuse)*.

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater Vulnerability is a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI currently classifies the aquifer vulnerability in the region of the subject site as *High (H)* to *Extreme (E)* which indicates an overburden depth of less than 3 metres to 3m-5m of low permeability soil present.

Groundwater Quality

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of '*Good Status'* in water bodies that are of lesser status at present and retaining '*Good Status'* or better where such status exists at present. *'Good Status'* was to be achieved in all waters by 2015, as well as maintaining '*High Status'* where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities, and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

The Groundwater Body (GWB) underlying the site is the Mitchelstown GWB (EU Groundwater Body Code: IE_SW_G_082). The 2013-2018 WFD status of the Mitchelstown GWB is *'Poor Status'*, with a Ground Waterbody Risk score of *'At Risk of Not Achieving Good Status'*. The Mitchelstown GWB has a *Good Status* for quantitative category, however, is it considered poor due to the chemical status of the overall GWB. The overall status is considered "*Poor"* due to "*Nitrate (as NO_3) Failure for Chemical Status SW_G_082*". However, based on most recent monitoring of this groundwater body by the EPA (2016-2021), this groundwater body is considered *'Good Status'*.

4.0 ASSESSMENT METHODOLOGY

4.1 Introduction

As stated above (**Section 1.2**) projects that have the potential to impact on current or predicted WFD status are required to assess their compliance against the objectives defined for potentially affected water bodies.

4.2 No Deterioration Assessment

The no deterioration baseline for each water body is the status that is reported in **Section 3.4** Surface Water Quality and **Section 3.6** Groundwater Quality. There are no '*high status'* waterbodies within the study area, while the underlying bedrock aquifer (groundwater body) is considered '*Good status' (2016-2021)*.

4.2.1 Surface Water No Deterioration Assessment

Table 4.1 below presents the matrix used to assess the effect of the operational discharges on surface water status or potential class. It ranges from a major beneficial effect (*i.e*., a positive change in overall WFD status) through no effect to deterioration in overall status class. The colour coding used in **Table 4.1** is applied to the spreadsheet assessment in **Appendix A** of this report.

Table 4-1 *Surface Water Assessment Matrix*

Effect	Description/ Criteria	Outcome
Major Beneficial	Impacts that taken on their own or in combination with others have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody	Increase in status of one or more WFD element giving rise to a predicted rise in status class for that waterbody.
Minor/ localised beneficial	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements	Localised improvement, no change in status of WFD element
No Impact	No measurable change to any quality elements.	No change
Localised / temporary adverse effect	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary deterioration that does not affect the overall WFD status of the waterbody or any quality elements. Consideration will be given to habitat creation measures.	Localised deterioration, no change in status of WFD element when balanced against mitigation measures embedded in the project.
Adverse effect on class of WFD element	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the WFD status class of one or more biological quality elements, but not in the overall status of the waterbody. Consideration will be given to habitat creation measures.	Decrease in status of WFD element when balanced against positive measures embedded in the project.

Adverse effect on overall WFD class of waterbody	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the ecological status or potential of a WFD quality element, which then lead to a deterioration of status/potential of waterbody.	Decrease in status of overall WFD waterbody status when balanced against positive measures embedded in the project.

4.2.2 Groundwater No Deterioration Assessment

Table 4.2 below presents the matrix used to assess the effect of the operational discharges on groundwater status class. It ranges from a beneficial effect but no change in status to deterioration in overall status class. The colour coding used in **Table 4.2** is applied to the spreadsheet assessment in **Appendix A** of this report.

Table 4-2 *Groundwater Assessment Matrix*

Magnitude of Impact of the proposed development on WFD Element	**Effect on WFD Element within the assessment boundary**	**Effect on Status of WFD element at the Groundwater Body Scale**
Impacts lead to beneficial effect	Combined impacts have the potential to have a beneficial effect on the WFD element.	Improvement but no change to status of WFD element
No measurable change to groundwater levels or quality.	No measurable change to WFD elements.	No change and no deterioration in status of WFD element
Impacts when taken on their own have the potential to lead to a minor localised or temporary effect	Combined impacts have the potential to lead to a minor localised or temporary adverse effect on the WFD element.	Combined impacts have the potential to lead to a minor localised or temporary effect on the WFD element. No change to status of WFD element and no significant deterioration at groundwater body scale.
Impacts when taken on their own have the potential to lead to a widespread or prolonged effect.	Combined impacts have the potential to have an adverse effect on the WFD element.	Combined impacts have the potential to have an adverse effect on the WFD element, resulting in significant deterioration but no change in status class at groundwater body scale.
Impacts when taken on their own have the potential to lead to a significant effect.	Combined impacts in combination with others have the potential to have a significant adverse effect on the WFD element.	Combined impacts in combination with others have the potential to have an adverse effect on the WFD element AND change its status at the groundwater body scale

4.3 Future Status Objectives

RBMPs are used to outline water body pressures and the actions that are required to address them. The future status objective assessment considers the ecological potential of a surface water body and the mitigation measures that defined the ecological potential. Assessments in this Project are based on mitigation measures defined in EIAR which will not impact on the WFD status and risk as well as the

objectives set out in the 2nd Cycle RBMP 2018-2021 and *draft* 3rd Cycle RBMP 2022-2027. The assessment considers whether the proposed development has the potential to prevent the implementation or impact the effectiveness of the defined measures.

5.0 WATER FRAMEWORK DIRECTIVE ASSESSMENT

5.1 General Approach and Project Details

The WFD Assessment uses a spreadsheet tool to assess the effects of the operational discharges on each of the WFD elements (biological, physico-chemical and hydromorphological surface water elements, and quantitative and chemical groundwater elements).

Both the surface water assessment and the groundwater assessment examine the potential effects of the operational discharges of the Mallow WwTW. A full description of The Project is detailed in **Chapter 3** of the EIAR.

- **Primary Discharge:** It is proposed that the primary discharge will be discharged into the nearby Blackwater (Munster)_140 River.
- **Overflow:** There will be a single Dual Function Overflow (SW010) from the new Bridge Street Pumping Station in the agglomeration which will operate as an SWO or EO *i.e.,* an overflow which can act as a SWO or as an EO depending on the event.

For surface water & groundwater, the potential effects identified are as a result of:

- Operational discharges; and
- Accidental [unintended] discharges and spills

Appendix A contains the surface water and groundwater assessments where the above potential effects are considered. The colour coded system referred to in **Table 4-1** and **Table 4-2** above is used to give a visual impression of the assessment.

5.1.1 Summary of Source-Pathway-Receptor (S-P-R) Model

The table below **(Table 5.1**) describes the S-P-R model for the operational discharges.

Table 5.1 *Source-Pathway-Receptor (S-P-R) Model (Pollutant Linkage Assessment) (with mitigation)*

Source	Pathways	Receptors considered	Risk of Impact	Mitigation Measures
Primary Discharge (SW001) to the Blackwater (Munster)_140 waterbody.	Direct pathway to hydrological environment *via* the upgraded Mallow WwTP	Hydrological environment (Blackwater (Munster)_140 River)	No perceptible risk as an assimilative capacity assessment for a conservative scenario demonstrates that there is sufficient capacity to dilute the treated water quality to S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended.	There will be no deterioration of the water quality status of the waterbody. Mitigation measures to avoid or reduce the potential impacts of SW001 on the WFD status are therefore not required.
Dual Function Overflow (SW010) to the Blackwater (Munster)_140 waterbody.	Direct pathway to hydrological environment *via* new Bridge Street Pumping Station	Hydrological environment (Blackwater (Munster)_140 River)	No perceptible risk due to the implementation of the design measures which includes improved attenuation of stormflow and improved treatment processes prior to discharge to the hydrological environment.	There will be no deterioration of the water quality status of the waterbody. Mitigation measures to avoid or reduce the potential impacts of SW010 on the WFD status are therefore not required.

5.2 No Deterioration Assessment

5.2.1 Hydrological Environment

The WwTP upgrade has been designed to meet the current D0052-01 ELVs along with a more onerous Ortho-phosphate ELV. The assimilative capacity calculations (**Appendix 2** of the EIAR) demonstrate that based on background water quality, future loads and 95%ile flows that the ELV's are sufficient to ensure the WFD waterbody objective of Good status can be met. Calculations show that the Assimilative Capacity would not exceed the established threshold values for Biological Oxygen Demand (BOD), Total Ammonia and Ortho-phosphate in the receiving Blackwater (Munster) waterbody in order to achieve both *'Good'* and '*High*' status. Therefore, there will be no deterioration of the water quality status of the waterbody.

It should be noted that WFD objective of Good status does not align with the restoration of High water quality conditions required for Freshwater Pearl Mussel. While there is no High status objective for this waterbody, the 2013-2018 status for Ortho-phosphate and Ammonia is High. The WAC calculation demonstrates that the Ortho-phosphate and Ammonia High status will be maintained.

In terms of the new Bridge Street Pumping Station there is the potential for overflows during a storm event. However it is important to reiterate that, SW010 has been designed to meet the definition of '*Storm Water Overflow'* as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995 and a number of measures have been incorporated into the design to prevent unintended discharges (Refer to **Attachment C.2** of WWDL Application Review Documentation).

In 2019 further information was submitted to the Planning Authority in response to a query regarding the impact of an overflow during low river flow conditions (TJ O'Connor & Associates, 2019). This theorical exercise considered a '*worst case scenario'* 1 year storm event. Using the network model, a storm event that resulted in the highest flow through the overflow storm tank was selected. On the basis of future loads, a series of mass balance calculations was carried out. The predicted resultant concentrations in the river meet the Urban Pollution Manual 99 %ile standards as applicable to WFD High status waters. The scenario modelled was highly conservative and unlikely to arise as it did not consider any additional flows to the river from the catchment which would occur in a storm event (thus providing greater dilution). These events are temporary (short-lived) in highwater events and have no long-term negative impact on the waterbody quality.

Provision for a standby power supply will be made at the new Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater River *via* the EO (SW010) at NGR 156636E, 097862N. In this context, Emergency discharges from SW010 will be highly unlikely as all appropriate design measures and mitigation to prevent EOs that can be applied have been incorporated in the pumping station design, however, should one occur, it will be temporary (short-lived) and have no long-term negative impact on the waterbody quality.

There is no dewatering associated with this Project, hence there is no impact on the hydrological environment in terms of baseflow.

Based on the above, overall, the potential effects on the WFD status to the waterbodies are considered "*No Impact*" *i.e.,* no change to the WFD status or elements in terms of the hydrological environment.

5.2.2 Mitchelstown Groundwater Body (GWB)

There are no potential impacts to the hydrogeological environment as there is no discharge to ground or active dewatering associated with the operational discharges.

Overall, the potential effects on the WFD status to the waterbodies are considered to have "*No impact*" *i.e.,* no change to the WFD status or elements in terms of the underlying hydrogeological environment.

5.3 Future Good Status

Despite a reduction in the number of waterbodies impacted, excess nutrients remain the most prevalent issue in the Blackwater (Munster) Catchment impacting 34 waterbodies in Cycle 3. Morphological issues are impacting 18 waterbodies, organic pollution is impacting 13, hydrological impacts are affecting 11, sediment issues are impacting nine and chemical pollution is impacting one groundwater body (Glenville). There are also 11 At Risk waterbodies where the impact type falls under the other category.

- For rivers, the main significant issues are nutrient pollution (25), morphological issues (18), hydrological issues (11), organic pollution (11), sediment (9) and unknown impacts (4).
- The only At Risk transitional waterbody (Lower Blackwater M Estuary / Youghal Harbour) is impacted by nutrient and organic pollution.
- The only At Risk coastal waterbody (Youghal Bay) is impacted by nutrient and organic pollution.
- Nutrient pollution is the issue in seven of the eight At Risk groundwater and the impact in the remaining waterbody bodies Glenville is chemical pollution. There are additional impacts types attributed to seven of these groundwater body mainly unknown impact type or diminution of quality of associated surface waters for chemical reasons.

As mentioned in **Section 3.4** of this Report, the main catchment pressure is agricultural. Therefore, the main potential contaminates are phosphate and nitrates which are mainly associated with agricultural activities. The subject matter of this assessment are the operational discharges associated with the Mallow agglomeration WWDL review application and therefore will not hinder catchment improvement measures.

At present there are no local targeted measures within the catchments to maintain or achieve improvements to the status of the water bodies. However, the following are some pressures associated with waterbody catchments:

- Physical Modifications.
- Management of pollution from agricultural activities.
- Management of pollution from sewage and waste water.
- Management of pollution from urban environments.
- Changes to natural flow and levels of water.
- Managing invasive non-native species.

Based on the above information it is considered that any of the aspects of the operational discharges will not prevent the WFD objectives from being achieved or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

6.0 CONCLUSIONS

This WFD Screening Assessment indicates that, based on the nature of the operational discharges, there is no potential for adverse or long-term effects on the Blackwater (Munster) surface water body. It has been assessed that the operational discharges will not cause any significant deterioration or change in the current water body Good status or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

The WFD objective of Good status does not align with the restoration of High water quality conditions required for Freshwater Pearl Mussel. However, the assimilative capacity calculations demonstrate that the proposed ELV's are sufficient to ensure the 95%ile EQS's for High status can be met for BOD, Ortho-phosphate, and Ammonia.

The WFD Screening Assessment indicates that there is no potential for adverse or minor temporary or localised effects on the Mitchelstown groundwater body. Therefore, it has been assessed that the operational discharges will not cause any significant deterioration or change in groundwater body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

No further assessment of WFD is recommended given that no significant deterioration or change in water body status is expected based on the nature of the operational discharges, SW001 and SW010.

7.0 STUDY LIMITATIONS

The conclusions and recommendations listed above are based on our current understanding of the operational discharges. This has been formed from review of historical maps, review of current and previous environmental and engineering reports for the project. This information is taken as being accurate and true.

Public databases held by the EPA, GSI, OPW, NPWS and OSI have been consulted and the most recent available data has been referenced.

No subsurface or destructive testing was carried out as part of this assessment.

8.0 REFERENCES

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- Ordnance Survey of Ireland (OSI).
- Teagasc subsoil database.
- River Basin Management Plan for Ireland 2018-2021.
- *Draft* River Basin Management Plan for Ireland 2022-2027.
- Cork County Development Plan 2022-2028.

APPENDIX A

WATER FRAMEWORK DIRECTIVE ASSESSMENT MATRIX

Risk screening of potential to cause deterioration of current WFD status						
	SURFACE WATER	Scheme Elements	**Mallow WWDL (D0052-01) Review Application**		**Mitigation Measures**	**Overall Impact with mitigation measures**
	IE_SW_18B021720	Phase (Operation)	**Operational Discharges**			
	Blackwater (Munster) Catchment and associated streams	Identified Quantitative Impacts	**SW001**	**SW010**		
WFD Status	**Macrophytes and phytobenthos - combined**	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	**There will be no deterioration of the water quality status of the Blackwater (Munster)_140 River.** **Mitigation measures to avoid or reduce the potential impacts of the operational discharges (SW001 and SW010) on the WFD status are therefore not required.** **Details of Design Measures**: The Mallow WwTP has been designed to IW design standards to ensure that the effluent discharge parameters are compliant with proposed ELVs. As described in Chapter 3 of the EIAR, a WAC was carried out to verify that the proposed ELVs are fit for purpose and have been appropriately assigned to ensure that the receiving waterbody has the capacity to accommodate the proposed discharge from the upgraded WwTP without causing a breach in the relevant standards as outlined in National and European legislation. SW010 has been designed and will operate to meet the definition of '*Storm Water Overflow*' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995. Provision for a standby power supply will be made at the new Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater River *via* the Emergency Overflow. In this context, Emergency discharges from SW010 will be highly unlikely as all appropriate design measures and mitigation to prevent Emergency Overflows that can be applied have been incorporated in the design of SW010. All alarms will be linked to level measurement to alert to any spillage and will be linked to SCADA with alarms sent to operators in the result of an emergency event. An Emergency Response Plan and Procedures, Operation and Maintenance Procedures for all equipment is in place and will be implemented by the appointed plant operator, as required. Refer to **Attachment C.2** of WWDA Review Application Documentation for further details on Measures to Prevent Unintended Discharges to the Blackwater (Munster)_140 River.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Macroinvertebrates		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Fish		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Physio-Chemical Status	**Total Ammonia**	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Total Nitrogen		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Ortho-Phosphate		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Hydromorphological Elements	**Quantity and dynamics of river flow**	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Connection to Groundwater		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River continuity		Not Applicable.	Not Applicable.		Not Applicable.
	River depth and width variation bed		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure and substrate of river bed		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure of riparian zone		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status

Risk screening of potential to cause deterioration of current WFD status						
	GROUNDWATER	Scheme Elements	**Mallow WWDL (D0052-01) Review Application**		**Mitigation Measures**	**Overall Impact**
	IE_SW_G_082	Phase (Operation)	**Operational Discharges**			
	Mitchelstown GWB	Identified Quantitative Impacts	**SW001**	**SW010**		
Quantitative Elements	**Saline or other intrusions.** To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	**There will be no deterioration of the water quality status of the Mitchelstown Groundwater Body .** **Mitigation measures to avoid or reduce the potential impacts of the operational discharges (SW001 and SW010) on the WFD status of the Mitchelstown Groundwater Body are therefore not required**. **Details of Design Measures:** The Mallow WwTP has been designed to IW design standards to ensure that the effluent discharge parameters are compliant with proposed ELVs. As described in Chapter 3 of the EIAR, a WAC was carried out to verify that the proposed ELVs are fit for purpose and have been appropriately assigned to ensure that the receiving waterbody has the capacity to accommodate the proposed discharge from the upgraded WwTP without causing a breach in the relevant standards as outlined in National and European legislation. SW010 has been designed and will operate to meet the definition of '*Storm Water Overflow*' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007, as amended and the criteria as set out in the DoEHLG '*Procedures and Criteria in Relation to Storm Water Overflows*', 1995. Provision for a standby power supply will be made at the new Bridge Street Pumping Station to provide for continued operation of the pumping equipment in the event of an interruption in the power supply. In the unlikely event where the backup generator fails and where there is a prolonged power failure, the wastewater will begin to fill the stormwater tank until it reaches its capacity and will then be discharged to the Blackwater River *via* the Emergency Overflow. In this context, Emergency discharges from SW010 will be highly unlikely as all appropriate design measures and mitigation to prevent Emergency Overflows that can be applied have been incorporated in the design of SW010. All alarms will be linked to level measurement to alert to any spillage and will be linked to SCADA with alarms sent to operators in the result of an emergency event. An Emergency Response Plan and Procedures, Operation and Maintenance Procedures for all equipment is in place and will be implemented by the appointed plant operator, as required. Refer to **Attachment C.2** of WWDA Review Application Documentation for further details on Measures to Prevent Unintended Discharges.	No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	Surface water To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of groundwater abstractions on the condition of GWDTE'S.		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	Water balance To identify groundwater bodies where abstractions exceed the available resource.		Not Applicable (no water supply from borehole anticipated)	Not Applicable (no water supply from borehole anticipated)		Not Applicable
Chemical Elements	**Saline or other intrusions** To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	Surface water To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of nutrient concentrations in groundwater (primarily phosphates) on GWDTE's.		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	Drinking Water Protected Areas (DrWPAs) To identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status
	General quality assessment To identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.		No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrogeological environment with no deterioration to the WFD Status